

3 Environment and Effects

SOCIAL ENVIRONMENT

Transportation

Introduction

National Forest Transportation System roads are constructed to provide access to NFS lands and are included in the Forest Development Transportation Plan (see Transportation Standards and Guidelines in Chapter 4 of the Forest Plan). They are considered NFS roads as are other roads that are wholly or partially on NFS lands and are intended to be maintained for the long term (see Chapter 4 for a glossary with transportation terms). With the exception of a few administrative sites and campgrounds, most forest roads are single lane, constructed with blasted quarry rock, and designed for off-highway loads.

The NFS roads in the analysis area were originally built for logging and the associated administration, though incidental recreational and subsistence use occurs throughout the area. Road construction in support of logging activities began in the 1960s. Road construction peaked during the 1970s and 1980s in support of the pulp mill in Ketchikan.

This analysis considers the effects of the new construction and reconstruction of roads used to access the proposed timber harvest. It also analyzes the status of these roads after timber harvest (open or closed). The units used in this report for measuring the effects and comparing the alternatives include the following:

- § Miles of NFS road construction,
- § Miles of temporary road construction,
- § Miles of NFS road reconstruction,
- § Miles of road to remain open to motorized vehicle traffic,
- § Miles of road to be closed associated with these timber harvest activities, and
- § Cost including maintenance of open roads, reconstruction, and new (NFS and temporary) road construction.

Methodology

The analysis area for the transportation system includes the project area and road segments leading into the project area. Roads extending from within the project area and terminating outside the project area are also included, as travel within the project area is required to reach these road segments.

Information sources for transportation analysis include the transportation GIS records which house the spatial data for road locations. A complete list of road attributes and definitions of these attributes is located in the project record.

The Forest Service has conducted road condition surveys on many of the existing roads in the Big Thorne project area. These surveys supply site-specific detailed information about each road (and section of road) surveyed as of the date of the survey, including the following:

- § Whether the road, or a particular section of the road, is drivable;

- § Number, size, and condition of drainage structures and bridges;
- § Barriers to vehicle access (vegetation, barrier ditches, pulled bridges, slides, etc.);
- § Maintenance requirements; and
- § Barriers to fish passage through road drainage structures.

This information is used to (1) identify maintenance trends, (2) provide information for problem analysis, and (3) set priorities for scheduling and funding work. The detailed road condition surveys can be found in the Big Thorne Project record. The majority of the road condition surveys within the project area were completed between 1998 and 2002. However, portions of the road condition surveys are updated annually through 2012 with emphasis given to road-stream crossing sites. The updated records have been added to the project record. Additionally, project roads have been surveyed to determine work required to recondition or perform additional storage. These road surveys have also been included in the project record.

Proposed new road construction routes were laid out by transportation specialists and field reviewed by resource specialists during 2010 and 2011. Specific comments and concerns along with site-specific mitigation measures are discussed in the respective resource reports and in the road cards for system roads or the unit cards for temporary roads. Roads are included or excluded from each alternative based on access needed for the alternative and the alternative design criteria.

Affected Environment

Forest roads are classified as NFS roads, temporary roads, and unauthorized roads by 36 CFR 212.1. The definitions for these road types are provided below.

- § *National Forest System road*: “A forest road other than a road which has been authorized by a legally documented right-of-way held by a State, county, or other local public road authority.” NFS roads are generally required to provide long-term or intermittent motor vehicle access. These roads receive constant or intermittent use depending upon the timing of the timber harvest(s) and other activities. NFS roads form the primary transportation network in the project area. When a road is not needed in the short term but future use is anticipated, it is closed and placed in storage.
- § *Temporary road or trail*: “A road or trail necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road or trail, and that is not included in a forest transportation atlas.” Temporary roads are intended for short-term use and maintained for a limited time usually to access a timber harvest unit. Temporary roads are decommissioned after a timber harvest. Road decommissioning activities result in the stabilization and restoration of unneeded roads to a more natural state. The term “decommissioned roads” generally refers to temporary roads constructed for timber harvests that have had stream courses restored, culverts removed, waterbars added where needed, and cut and fill slopes re-vegetated.
- § *Unauthorized Road or Trail*: “A road or trail that is not a forest road or trail or a temporary road or trail and that is not included in a forest transportation atlas.”

3 Environment and Effects

These include unplanned roads and off-road vehicle tracks that have not been designated and managed as roads or trails. Roads that are no longer under permit or authorization and have not been decommissioned are also considered unauthorized.

Road Maintenance and Reconstruction

The maintenance and reconstruction of the existing system roads depend largely on the volume of timber hauled and, to a lesser extent, on public use. Road maintenance consists of periodic repairs to an existing road surface, brushing, cleaning, and repairing drainage features. Maintenance can include reconditioning the original road template, grading the road surface, cleaning roadside ditches, and removing vegetation that may encroach upon the road or block vision.

NFS roads are managed by a system of maintenance levels (ML), depending on their intended use and suitability for various types of vehicles. These levels range between ML 1 (closed and in storage), ML 2 (suitable for high-clearance vehicles), ML 3 (suitable for passenger vehicles, rough surface), ML 4 (suitable for passenger vehicles, smooth surface), and ML 5 (suitable for passenger cars, dust free, possibly paved). Grading and other maintenance would generally take place more often on a maintenance level 4 road than on a level 3 road, and would be expected to occur less often on a level 2 road. ML 1 roads are left to a self-maintaining condition that requires little or no maintenance. These tasks are performed to keep the roads in the safe and useful condition for which they were designed. Repairs may be accomplished as annual maintenance.

Maintenance and reconditioning of existing NFS roads is an ongoing process that occurs on a periodic basis. Normally this type of work is determined to fit the category of routine repair and maintenance of roads that do not individually, or cumulatively have a significant effect on the quality of the human environment and may be categorically excluded (FSH 1909.15, 31.12). The maintenance and reconditioning of NFS roads in the project area may occur before, during, and after the project analysis. This work is done through separate service contracts to reduce the backlog of deferred maintenance, recondition roads to comply with best management practices, and maintain the existing infrastructure for National Forest management activities. The timing of this work may coincide with this project's analysis, but is not part of this project. Any effects from ongoing road maintenance and reconditioning work are included in the cumulative effects analysis for this project.

Management of NFS roads is dynamic in the sense that roads are given both an operational maintenance level (OPML) and an objective maintenance level (OBML). The purpose of maintenance levels is to define the level of service provided by, and maintenance required for, a specific road or segment. Roads are often built and operated at a higher maintenance level during the timber sale or other activities than they are afterwards.

OPML is the maintenance level currently assigned to a road considering current needs, road condition, budget constraints, and environmental concerns. It defines the level to which the road is currently being maintained. It reflects the current condition.

OBML is the maintenance level to be assigned at a future date considering future road management objectives, traffic needs, budget constraints, and environmental concerns. The objective maintenance level may be the same as, or higher or lower than, the operational maintenance level (FSH 7709.58, Sec. 12.3 – Transportation System Maintenance Handbook).

Roads can be changed from the OPML status to the designated OBML through a variety of activities. Road storage is the most common activity, which redesignates a road from a ML 2 to ML 1. This can occur at any time due to the analysis completed in the POW Access Travel and Management DN/FONSI and based on resource needs, funding, and management direction.

The current OPML and OBML of NFS roads in the Big Thorne project area are displayed in Table TRAN-1. Annual maintenance costs are higher for roads with higher maintenance levels and lower for those with lower maintenance levels. Annual maintenance costs are estimated at \$182 per mile per year for ML1 roads, \$872 per mile per year, and \$1,231 per mile per year (see Transportation Resource Report).

Table TRAN-1. Big Thorne Analysis Area NFS Roads

Operational Maintenance	Objective Maintenance	Miles
1 - Basic Custodial Care (Closed)	1-Basic Custodial Care (Closed)	118
	2-High Clearance Vehicles	2
	D-Decommission	7
2 - High Clearance Vehicles	1-Basic Custodial Care (Closed)	81
	2-High Clearance Vehicles	107
	3-Suitable For Passenger Cars	1
	D-Decommission	8
3 - Suitable For Passenger Cars	2-High Clearance Vehicles	1
	3-Suitable For Passenger Cars	50
Total		375

Marine Access Facility

An MAF is an area used by humans to transfer items from land to saltwater or vice versa, that contains a structure such as a mooring buoy, dock, LTF, boat ramp, or a combination of these. An LTF is used to transfer logs and timber products from land-based transportation forms to water-based transportation forms (or vice-versa). These facilities are often used for the movement of equipment needed for logging and road building. There are two existing LTFs in or near the Big Thorne project area, one at Coffman Cove and one at Thorne Bay. Both are viable options for a timber purchaser to move logs off Prince of Wales Island.

Rock Quarries

There is a need for a rock source during the construction of the new system and temporary roads, and reconstruction and maintenance of the existing NFS roads in this project. It is preferred that the rock source is close to the site of road construction or maintenance, usually within 2 miles.

There are numerous rock quarries throughout the project area and usually there is one within a few miles of the proposed site. The easy accessibility of existing rock quarries

3 Environment and Effects

may eliminate the need to develop some new rock quarries. New rock quarries may be developed to support new road construction and road maintenance. Quarry sites would be developed within 500 feet of a road and avoid Class I and Class II stream buffers, old-growth habitat reserves, eagle and goshawk nest tree buffers, and non-developmental LUDs. With either the expansion of an existing quarry or the development of a new site, the area footprint would not exceed 5 acres.

Approximately 15 percent (35,074 acres) of the Big Thorne project area is underlain by the Descon Formation. The Descon Formation is an Ordovician to Silurian aged black, thin-bedded shale and/or chert. Most of the Descon Formation area indicated on the geologic map of the Big Thorne project area contains disseminated pyrite. Some shear and fault zones within this formation are more heavily mineralized than others. The Coffman Cove Road project (a Federal Highways project) utilized a rock source from this Formation within a mineralized shear zone for a portion of the construction. The use of this pyritic material in the road's subgrade resulted in the generation of ARD, which negatively impacted water quality and aquatic environments downstream of the construction. Subsequent testing of the waters above the Coffman Cove Road cleanup effort showed some metal values exceeding Alaska State Water Quality Standards, suggesting that mineralization exists in other zones within the watersheds. Existing Forest roads and quarries in this area are constructed from the Descon Formation. It is estimated that 254 miles of existing road likely constructed from the Descon Shale exist within the project area. It is not known if the material sources used in this construction contained mineralization. However, no previous problems have been observed (Baichtal personal comm. 2011).

Road construction and quarry development within the project area would utilize and excavate into the underlying Descon Shale (see individual alternative discussions for amount of road built across Descon Shale bedrock). Any existing material source or newly developed source within the Descon Formation and used to construct access to the proposed harvest areas shall be assessed as to its acid rock drainage (ARD) potential.

Travel Analysis Process

The desired condition for the Forest transportation system is guided in part by 36 CFR 212.5 – Road System Management. Part b provides guidance for determining the minimum road system needed.

The Travel Analysis Process (TAP), formerly referred to as the Roads Analysis Process (RAP), is a tiered, science-based system of analysis. The first tier is the Forest-wide Roads Analysis, which is an analysis for the entire Tongass National Forest (USDA Forest Service 2003b). The Forest-wide Roads Analysis provided management recommendations for maintenance level (ML) 3, 4, and 5 roads. The second tier, or mid-level tier, is the Prince of Wales Roads Analysis, which includes the Big Thorne project area (USDA Forest Service 2005c). This report details the analysis methods and recommendations for travel management for ML 1 and 2 roads on the Thorne Bay and Craig Ranger Districts. Copies of these analyses are located in the project record. Combined, these analyses recommend road management objectives for all existing NFS roads on Prince of Wales Island. Recommendations documented in the Prince of Wales roads analysis, supplemented by input from public comment, led to the proposed action

developed for the ATM for Prince of Wales and surrounding islands (USDA Forest Service 2009a).

The third tier is the project-level analysis. The proposed road management objectives (RMOs) for the project area are included in this analysis. The RMO plan for each proposed system road in the project area is also detailed in the road cards. The Draft EIS road cards are provided in Appendix C of the Draft EIS and the Final EIS road cards are located in the project record; the selected roads will become part of the Record of Decision (ROD) and road cards for the selected roads will be included with the ROD.

The Big Thorne travel management plan incorporates the Decision Notice for the Prince of Wales ATM (2009). The ATM institutes a system of routes designated for motor vehicle use including class of vehicle, and if appropriate, time of year for motor vehicle use. The designated route system is shown on a Motor Vehicle Use Map (MVUM). The map can be updated annually and will be adjusted as conditions change. These maps are available at the Craig and Thorne Bay Ranger District offices.

Descriptions of Travel Management Designations are as follows:

- § *Open And Maintain* – Maintain open for use by high-clearance vehicles; OHV use will not be allowed.
- § *Open and Maintain with OHV* – Maintain open for mixed use by high-clearance vehicles and OHVs. Engineering suitability study has been conducted prior to designation of mixed use on the motor vehicle use map.
- § *Storage* – Each drainage structure is evaluated to determine the appropriate storage strategy. Drainage structures may be removed or bypassed with waterbars to restore natural drainage patterns. Additional water bars or rolling dips may be added to control runoff. Seed and fertilize disturbed soils. This is intended to be the primary maintenance strategy applied on intermittent use roads during their closure cycle. ML 1, closure and basic custodial maintenance, is assigned. This level of maintenance is synonymous with Alaska Forest Resources Practices Act designation of inactive roads.
- § *Decommission* – This takes the road out of the National Forest Road System. Decommissioning roads involves restoring roads to a more natural state. Activities used to decommission a road may include, but are not limited to, the following: reestablishing former drainage patterns, stabilizing slopes, restoring vegetation, blocking the entrance to the road, installing water bars, removing culverts, reestablishing drainage-ways, removing unstable fills, pulling back road shoulders, or other methods designed to meet the specific conditions associated with the unneeded road. This level of maintenance is synonymous with Alaska Forest Resources Practices Act designation of closed roads.
- § *Motorized Trail* – NFS road will be stored as ML 1 road, but will be dual-designated as motorized trail for OHV use. Site-specific designs may be required prior to designation on the motor vehicle use map.
- § *Hiking Trail* – This takes a road out of the National Forest Road System and places it into a recreational trail. No motorized access is allowed.

3 Environment and Effects

- § *Seasonal Closure* – NFS road will remain drivable with most structures remaining; however, the road will be seasonally closed by designating it as such on the MVUM map. The road will have an OPML of 1. Additional water bars or rolling dips may be added to control runoff.

RMOs define the intended purpose of an individual road based on management area direction and access management objectives. RMOs contain design criteria, operation criteria, and maintenance criteria. The proposed travel management designations for each existing NFS road segment in the project area are included in the Record of Decision for the Prince of Wales ATM. The RMOs for existing roads with proposed changes and proposed new NFS roads are included in the Big Thorne Travel Analysis Report (see Big Thorne Project record). No changes were made to the existing road RMOs as defined in the Prince of Wales ATM.

Best Management Practices

BMPs are used to ensure soil and water resources are considered in transportation planning activities. Specific BMPs are listed by resource on the road cards in Appendix C of the Draft EIS. Effects of roads on resources are reduced through application of standards and guidelines and BMPs. The standards and guidelines particularly relevant to transportation can be found in the Forest Plan (USDA Forest Service 2008a) beginning on page 4-80.

Environmental Consequences

Alternative 1 – No Action

Direct and Indirect Effects

Under Alternative 1, no new road construction or reconstruction would occur as a result of the Big Thorne Project and current management plans would continue to guide the management of NFS roads. All system roads would be managed as directed by the Forest Plan, RMOs, and previous NEPA decisions. This alternative would neither increase nor decrease access to the area for recreational and subsistence activities. A decision to implement this alternative would not impact projects that are already planned or currently being implemented.

No changes would be made to the ATM for existing roads. The OBML is the maintenance level to be assigned at a future date considering future road management objectives, traffic needs, budget constraints, and environmental concerns. The OBML may be the same, higher, or lower than the operational maintenance level. Each NFS road has an OBML assigned. The current OBMLs assigned to each road would guide the future management of that road. As resources and funding become available, roads would be stored or upgraded to match the currently assigned OBML. Table TRAN-2 summarizes the miles of road available for each type of travel.

Table TRAN-2. Big Thorne Analysis Area OBML and RMO Plan

Objective Maintenance Level	Travel Management	Miles
1 – Basic	Seasonal Closure	11
	Motorized Trail	41
	Storage	146
	Total	198
2 – High Clearance Vehicles	Open & Maintain	24
	Open & Maintain With OHV	83
	Storage	2
	Total	109
3 – Suitable for Passenger Cars	Open & Maintain	53
	Total	53
D - Decommission	Decommission	12
	Motorized Trail	3
	Total	15
Grand Total		375

Cumulative Effects

Cumulative effects of past and proposed timber harvest result in a total of 375 miles of NFS road, 88 miles of other roads, and 117 miles of road grades that have been decommissioned, within the Big Thorne project area. Total roads, not including decommissioned roads, would be 463 miles, and, counting decommissioned road grades, would be 580 miles.

The Forest Plan’s transportation goal is to “Develop and manage roads and utility systems to support resource management activities; recognize the potential for future development of major Transportation and Utility Systems.” Alternative 1 proposes no new development of roads. This alternative would forfeit any opportunity to develop or enhance the current road system. Road maintenance, culvert replacement, and timber micro-sales would continue, and road closures prescribed by the Access Travel Management Plan would continue as funding allows.

Another cumulative effect of the No-action Alternative would be a forfeiture of any opportunity to integrate implementation of the Prince of Wales ATM with Big Thorne stewardship contracts. This may reduce funding opportunities and slow the implementation process for placing roads in storage and for the completion of road restoration projects.

Effects Common to all Action Alternatives

In addition to using existing roads, some new NFS and temporary road construction would be needed to access harvest units within the project area for silvicultural activities. All new construction would be off of the existing road system.

New System Roads

All newly constructed NFS roads would have an OBML of 1, but would be managed as a ML 2 during timber sale activities. After completion of the timber sale contract activities, these roads would remain open an additional 1 to 5 years to allow for firewood removal, regeneration surveys, microsales, and incidental uses. During this period the road would

3 Environment and Effects

be seasonally closed, and would be open only from May 1 to November 30. At the end of 1 to 5 years all new system roads would be placed in a self-maintaining hydrologic status. This would include the placement of drivable water bars or dips at all drainage culvert locations to direct water across the road in event that the culvert plugs. Each of the closed NFS roads would be needed periodically in the future for timber salvage and/or expansion into timber production LUDs.

New Temporary Roads

Temporary roads are not needed for long-term management of the National Forest. Temporary roads do not access future timber lands and do not have resource concerns that require engineering controls in construction. All temporary roads would be decommissioned after timber harvest. This involves removing culverts and bridges, restoring natural drainage patterns, and allowing the roadway to re-vegetate.

Road Reconstruction

Roads proposed for reconstruction are existing NFS roads currently in storage; most drainage structures have been removed to restore natural drainage patterns and the roadway has re-vegetated with alders in some cases. Reconstruction activities would include brushing, clearing of alders and replacing drainage structures. Reconstruction would keep the roads in a safe and useful condition for which they are managed, while meeting Forest Plan standard and guides and following the applicable BMPs (see RMO road cards for road site-specific items). No changes are being proposed to the OBML and RMO designated in the Prince of Wales ATM.

All reconstructed roads would be managed as ML 2 during timber sale activities. After completion of the timber sale contract activities, would remain open an additional 1 to 5 years for firewood removal, regeneration surveys, microsales, and incidental uses. During this period, the road would be a seasonally closed and would be open only from May 1 to November 30. At the end of 1 to 5 years these roads would be placed in a self-maintaining hydrologic status. This would include the placement of drivable water bars or dips at all drainage culvert locations to direct water across the road in event that the culvert plugs. Other design elements like oversized culverts may be used to help reduce the need for routine drainage maintenance. Each of the closed NFS roads would be needed periodically in the future for timber salvage and/or expansion into timber production LUDs.

These roads would be reviewed annually and would be categorized as intermittent service roads (ML 1) after the completion of timber sale and additional activities, and physically blocked or natural vegetation allowed to eliminate motorized access. Drainage structures would remain in place with additional cross drains (water bars and dips), and the road would be considered stored. A review would be conducted at the time of closure for any additional resource concerns needing to be addressed.

Wetlands Avoidance

An analysis was completed for the location of all new roads to minimize impacts to soils, water and associated resources in accordance with BMPs. Road location will be completed to avoid wetlands whenever practicable. Wetlands were unavoidable on some portions of the location due to safety, engineering design constraints, and consideration

for other resources. Alternatives to the location on wetlands would mean longer, higher-cost roads that may have impacted similar areas of wetlands. High-value wetlands were particularly avoided wherever practicable.

Alternative 2 – Proposed Action

Direct and Indirect Effects

Alternative 2 proposes construction of 8 miles of NFS road, of which 1 mile would be constructed over decommissioned existing road beds. Future harvest along these roads is a possibility, as well as future extensions. This alternative would enhance opportunities for other timber harvest projects by providing access through suitable timber lands. This alternative proposes construction of 24 miles of temporary road, of which 4 miles would be constructed over existing decommissioned road beds. All temporary roads would be decommissioned after timber sale activities are complete. This alternative would reconstruct and temporarily open 18 miles of NFS road currently in storage. New and reconstructed NFS roads would remain open shown on the Motor Vehicle Use Map, to highway legal vehicles, seasonally from May 1 to November 30 for 1 to 5 years to allow for firewood removal and incidental uses. Approximately 2 miles of roads would be converted to motorized trails when the roads are stored. With full ATM implementation, a total of 46 miles of motorized trails would exist in the project area.

Of the four action alternatives, Alternative 2 proposes the second highest amount of new road construction (Table TRAN-3). This alternative also ranks second highest in transportation development costs (Table TRAN-4). The road development proposed in this alternative would satisfy the minimum requirements needed to allow cost effective and efficient timber harvest. This alternative has a high proportion of conventional logging systems, as opposed to helicopter, relative to Alternatives 4 and 5. Conventional logging systems require more road development to allow access to the harvest units. The additional road development costs are offset by the lower harvest costs achieved by these systems. In areas where road development costs or resource concerns outweighed the benefits of road development, helicopter logging systems were used to allow harvest without additional road development.

Borrow pits and quarries would be needed for road construction. Every 2 miles of new road construction would require about a 2-acre rock quarry. This equates to about 26 acres of developed rock sources. Where feasible existing quarries would be used, however, most new road construction would require the development of new rock quarries. All newly developed borrow quarries would be reviewed and cleared by resource specialists prior to development. Reconstruction of decommissioned road grades would require significantly less rock. Typically this type of construction will utilize existing borrow quarries.

Road construction and quarry development within the project area would utilize and excavate into the underlying Descon Shale. It is estimated that 0.9 mile of new road construction and 1.0 mile of stored NFS road reconstruction would be across Descon Shale bedrock. Any existing material source or newly developed source within the Descon Formation and used to construct access to the proposed harvest areas shall be assessed as to its ARD potential.

3 Environment and Effects

Table TRAN-3. Big Thorne Project Area Existing and Proposed Roads^{1/}

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Proposed New – new construction	0.0	6.8	11.6	0.1	0.4
Proposed New – on existing decommissioned roads	0.0	1.5	2.3	0.1	0.4
Existing NFS roads	375	375	375	375	375
Total NFS roads after implementation	375	383	389	375	376
Total Other Roads (State, private)	88	88	88	88	88
Proposed Temp – new construction	0.0	19.6	25.4	3.2	8.1
Proposed Temp – existing decommissioned roads	0.0	4.2	12.1	8.0	7.7
Current Decommissioned Temp	117	117	117	117	117
Total Decommissioned Temp after implementation	117	137	143	120	125
Total Proposed – new construction	0.0	26.4	37.1	3.4	8.6
Total Proposed – new on existing decommissioned roads	0.0	5.7	14.4	8.1	8.1
Total Proposed Road Development	0.0	32.1	51.4	11.5	16.6
Reconstruction of Stored NFS Roads	0.0	18.1	36.7	19.3	17.5
Total Project Area Roads after implementation (not counting decommissioned roads)	463	471	477	463	464
Total Project Area Road Grades after implementation (counting decommissioned roads)	580	608	620	583	589

1/ Numbers may not sum correctly due to rounding.

Table TRAN-4. Big Thorne Road Development Costs

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
NFS Road Construction	\$0	\$1,282,000	\$2,242,000	\$26,000	\$86,000
Temporary Road Construction	\$0	\$2,321,000	\$3,160,000	\$555,000	\$1,068,000
NFS Stored Road Reconstruction	\$0	\$1,284,000	\$2,482,000	\$1,120,000	\$826,000
Total Road Development Cost	\$0	\$4,887,000	\$7,884,000	\$1,701,000	\$1,979,000

Note: Costs are estimated by road, but are not exact values; these values are presented to provide a relative comparison between the alternatives. All costs are subject to change.

1/ Numbers may not sum correctly due to rounding.

New road construction crosses six fish streams. All fish streams would be crossed with a bridge or log culvert structure. These structures would be evaluated on a case-by-case basis and would either be removed during road storage or remain in place. Storage would occur approximately 1 to 5 years after harvest unless the road is designated for immediate storage in the road card due to resource concerns.

Cumulative effects of past road development plus Alternative 2 would result in a total of 383 miles of NFS road, 88 miles of other roads, and 137 miles of decommissioned road grades within the Big Thorne project area (see Table TRAN-3). This is the second-highest amount of NFS and temporary roads created by an alternative; total roads, not

including decommissioned roads, would be 471 miles and, counting decommissioned roads, would be 614 miles. The increase in the cumulative amount of NFS roads would help achieve 2008 Forest Plan objectives and desired conditions for transportation, timber, and economics. With reasonably foreseeable projects, total NFS and temporary roads on NFS lands would only increase by about 1 mile.

Alternative 3

Direct and Indirect Effects

Alternative 3 proposes construction of 14 miles of NFS roads, of which 2 miles would be constructed over decommissioned road beds. All new construction would be from the existing or proposed road system with the exception of 3 miles which are constructed from a State road east of Thorne Bay (Proposed 3000145 and 3000147 roads). This alternative would reconstruct and temporarily open 37 miles of NFS road currently in storage. New and reconstructed NFS roads would remain open, as shown on the Motor Vehicle Use Map, to highway legal vehicles, seasonally from May 1 to November 30 for 1 to 5 years to allow for firewood removal. Approximately 3 miles of roads would be converted to motorized trails when the roads are stored. With full ATM implementation, a total of 47 miles of motorized trails would exist in the project area.

This alternative proposes construction of 38 miles of temporary road, of which 12 miles would be constructed over decommissioned road beds. All temporary roads would be decommissioned after timber haul is complete.

Of the four action alternatives, Alternative 3 proposes the highest amount of new road construction (Table TRAN-3). This alternative also ranks highest in transportation development costs (Table TRAN-4). The road development proposed in this alternative is the minimum amount of road required to harvest the units in accordance with the objectives of this alternative. This alternative harvests the largest amount of timber of any alternative. This alternative also has a high proportion of conventional logging systems being used, as opposed to helicopter. Conventional logging systems require more road development to allow access to the harvest units. The additional road development costs are offset by the lower harvest costs achieved by these systems. In areas where road development costs or resource concerns outweighed the benefits of road development, helicopter logging systems were used to allow harvest without additional road development. Borrow pits and quarries would be needed for road construction. Every 2 miles of new road construction would require about a 2-acre rock quarry. This equates to 37 acres of developed rock sources. Where feasible, existing quarries would be used; however, most new road construction would require the development of new rock quarries. All newly developed borrow quarries would be reviewed and cleared by resource specialists prior to development. Reconstruction of decommissioned road grades would require significantly less rock. Typically, this type of construction would utilize existing borrow quarries.

Road construction and quarry development within the project area would utilize and excavate into the underlying Descon Shale. It is estimated that 3.2 miles of new road construction, and 1.9 miles of stored NFS road reconstruction would be across Descon Shale bedrock. Any existing material source or newly developed source within the

3 Environment and Effects

Descon Formation and used to construct access to the proposed harvest areas shall be assessed as to its ARD potential.

New road construction crosses 14 fish streams. All fish streams would be crossed with a bridge or log culvert structure. These structures would be evaluated on a case-by-case basis and would either be removed during road storage or remain in place. Storage would occur approximately 1 to 5 years after harvest unless the road is designated for immediate storage in the road card due to resource concerns.

Cumulative Effects

Cumulative effects of past and proposed timber harvest result in a total of 383 miles of NFS road, 88 miles of other roads, and 143 miles of decommissioned road grades within the Big Thorne project area (see Table TRAN-3). This is the highest amount of NFS and temporary road developed by an alternative; total roads, not including decommissioned roads, would be 477 miles and, counting decommissioned roads, would be 620 miles. The increase in the cumulative amount of NFS roads would help achieve 2008 Forest Plan objectives and desired conditions for transportation, timber, and economics by developing a transportation system that could be utilized for future timber sales and silvicultural treatments. With reasonably foreseeable projects, total NFS and temporary roads on NFS lands would only increase by about 1 mile.

Alternative 4

Direct and Indirect Effects

Alternative 4 proposes construction of 0.2 mile of NFS road, of which 0.1 mile would be constructed over decommissioned road beds. All new construction would be from the existing and proposed road system. This alternative proposes construction of 11 miles of temporary road, of which 8 miles would be constructed over decommissioned road beds. All temporary roads would be decommissioned after timber haul is complete. This alternative would reconstruct and temporarily open 19 miles of NFS road currently in storage. New and reconstructed NFS roads would remain open, as shown on the Motor Vehicle Use Map, to highway legal vehicles, seasonally from May 1 to November 30 for 1 to 5 years to allow for firewood removal. Only about 0.1 mile of road would be converted to a motorized trail when it is stored. With full ATM implementation, a total of 44 miles of motorized trails would exist in the project area.

Of the four action alternatives, Alternative 4 proposes the lowest amount of new road construction (Table TRAN-3). This alternative also has the lowest transportation development costs (Table TRAN-4). The road development proposed in this alternative is the minimum amount of road required to harvest the units in accordance with the objectives of this alternative. This alternative harvests the smallest amount of timber of any alternative. In areas where road development costs or resource concerns outweighed the benefits of road development, helicopter logging systems were used to allow harvest without additional road development. This alternative emphasized minimal impacts on wildlife resources, which was achieved using a higher proportion of partial cut harvests with helicopter logging systems. Helicopter logging generally requires minimal additional road building. Longer yarding distances can be achieved, allowing timber to be yarded to

the closest existing road in most cases. The lower road development costs are offset by the higher harvest costs associated with this system.

Borrow pits and quarries would be needed for road construction. Every 2 miles of new road construction would require about a 2-acre rock quarry. This equates to 3 acres of developed rock sources. Where feasible existing quarries would be used; however, most new road construction would require the development of new rock quarries. All newly developed borrow quarries would be reviewed and cleared by resource specialists prior to development. Reconstruction of decommissioned road grades would require significantly less rock. Typically, this type of construction would utilize existing borrow quarries.

Road construction and quarry development within the project area would utilize and excavate into the underlying Descon Shale. It is estimated that 0.4 mile of stored NFS road reconstruction would be across Descon Shale bedrock. Any existing material source or newly developed source within the Descon Formation and used to construct access to the proposed harvest areas shall be assessed as to its ARD potential.

New road construction does not cross any fish streams. If any such streams would need to be crossed, a bridge or log culvert structure would be used. These structures would be evaluated on a case-by-case basis and would either be removed during road storage or remain in place. Storage would occur approximately 1 to 5 years after harvest unless the road is designated for immediate storage in the road card due to resource concerns.

Cumulative Effects

Cumulative effects of past and proposed timber harvest result in a total of 375 miles of NFS road, 88 miles of other roads, and 120 miles of decommissioned road grades within the Big Thorne project area. This is the lowest amount of NFS and temporary road created by any alternative (Table TRAN-3); total roads, not including decommissioned roads, would be 463 miles and' counting decommissioned roads, would be 583 miles.

The decrease in the cumulative miles of NFS roads, relative to the other action alternatives, would reduce access to more areas for future timber harvests or silvicultural treatments. This would reduce opportunities to move towards achieving the Forest Plan desired conditions for timber, transportation, and economics, resulting in higher transportation development costs to implement future timber sales and silvicultural activities. With reasonably foreseeable projects, total NFS and temporary roads on NFS lands would only increase by about 1 mile.

Alternative 5

Direct and Indirect Effects

Alternative 5 proposes construction of 0.8 mile of NFS road, of which 0.4 mile would be constructed over decommissioned road beds. All new construction would be from the existing and proposed road system. This alternative proposes construction of 16 miles of temporary road, of which 8 miles would be constructed over decommissioned road beds. All temporary roads would be decommissioned after timber haul is complete. This alternative would reconstruct and temporarily open 18 miles of NFS road currently in storage. New and reconstructed NFS roads would remain open, as shown on the Motor Vehicle Use Map, to highway legal vehicles, seasonally from May 1 to November 30 for 1 to 5 years to allow for firewood removal. Approximately 0.3 mile of road would be

3 Environment and Effects

converted to motorized trails when the roads are stored. With full ATM implementation a total of 44 miles of motorized trails would exist in the project area.

Of the four action alternatives, Alternative 5 proposes the second lowest amount of new road construction (Table TRAN-3). This alternative also ranks second lowest in transportation development costs (Table TRAN-4). The road development proposed in this alternative is the minimum amount of road required to harvest the units in accordance with the objectives of this alternative. This alternative harvests the least amount of timber of any action alternative. In areas where road development costs or resource concerns outweighed the benefits of road development, helicopter logging systems were used to allow harvest without additional road development. This alternative emphasizes minimal impacts on watersheds, which was achieved by minimizing stream crossings, road development, and the use of ground-based equipment. Helicopter logging would be used more extensively to accomplish these objectives. Helicopter logging generally requires minimal additional road building. Longer yarding distances can be achieved, allowing timber to be yarded to the closest existing road in most cases. The lower road development costs are offset by the higher harvest costs associated with this system.

Borrow pits and quarries would be needed for road construction. Every 2 miles of new road construction would require about a 2-acre rock quarries. This equates to 9 acres of developed rock sources. Where feasible existing quarries would be used; however, most new road construction would require the development of new rock quarries. All newly developed borrow quarries would be reviewed and cleared by resource specialists prior to development. Reconstruction of decommissioned road grades would require significantly less rock. Typically, this type of construction would utilize existing borrow quarries.

Road construction and quarry development within the project area would utilize and excavate into the underlying Descon Shale. It is estimated that 1.3 miles of stored NFS road reconstruction would be across Descon Shale bedrock. Any existing material source or newly developed source within the Descon Formation and used to construct access to the proposed harvest areas shall be assessed as to its ARD potential.

New road construction does not cross any fish streams. If any need to be crossed, they would be crossed with a bridge or log culvert structure. These structures would be evaluated on a case-by-case basis and would either be removed during road storage or remain in place. Storage would occur approximately 1 to 5 years after harvest unless the road is designated for immediate storage in the road card due to resource concerns.

Cumulative Effects

Cumulative effects of past and proposed timber harvest would result in a total of 376 miles of NFS roads, 88 miles of other roads, and 125 miles of decommissioned road grades within the Big Thorne project area (see Table TRAN-3); total roads, not including decommissioned roads, would be 464 miles and, counting decommissioned roads, would be 589 miles. The decrease in the cumulative amount of NFS roads would reduce access to more areas for future timber harvests or silvicultural treatments. This would reduce opportunities to move towards achieving the Forest Plan desired conditions for timber, transportation, and economics resulting in higher transportation development costs to implement future timber sales and silvicultural activities. With reasonably foreseeable

projects, total NFS and temporary roads on NFS lands would only increase by about 1 mile.

Comparison of Alternatives

Table TRAN-3 summarizes the miles of proposed road construction along with the miles of existing road for both NFS and temporary roads. Proposed construction is broken out to show the number of miles of new road location (new construction) and the number of miles that is reconstruction of a decommissioned road. Reconstruction of decommissioned roads typically results in less site impacts and is significantly lower in cost than new construction. Temporary roads are decommissioned after their period of use has expired; they will not be open and drivable and are not counted as part of the NFS roads network. Temporary roads are not needed for future access and are typically constructed to a lower design standard than system roads resulting in a lower construction cost. Temporary roads will not provide the public access to firewood after timber harvest is complete. System roads would remain open an additional 1 to 5 years for regeneration surveys, firewood removal, and incidental uses.

Estimated costs for construction of roads are shown in Table TRAN-4. NFS roads in Southeast Alaska are more expensive to build than in other parts of the nation. The major factor that contributes to higher costs is obtaining the rock for the roadbed. Rock is obtained by blasting bedrock, which is then hauled and shaped into a road over typically soft, uneven terrain. Other factors that contribute to the high cost of constructing Southeast Alaska roads include the higher costs of shipping and labor, the numerous drainage structures needed, and more complex logistics involved.

Road development costs are based upon regional average costs for constructing roads in Southeast Alaska. Costs are applied based upon an average cost per mile for different classifications of road construction and reconstruction with an additional cost per fish stream crossing. The following costs were used for estimating the road development costs for each alternative (Jacobson personal comm. 2011a):

§ New NFS road construction	\$175,000/mile
§ NFS road constructed over decommissioned road grade	\$30,000/mile
§ New temporary road construction	\$110,000/mile
§ Temporary road construction over decommissioned road grade -	\$20,000/mile
§ NFS stored road reconstruction	\$30,000/mile
§ Additional cost for fish stream crossings (temp. bridges)	\$20,000/bridge

Road storage can reduce annual and deferred road maintenance costs by removing drainage structures, installing waterbars, and other means to stabilize the road surface until the road is needed again. Decommissioning will remove the road from the NFS inventory. When a road is decommissioned, work items include a combination of the following: reestablishing former drainage patterns, stabilizing slopes, restoring vegetation, blocking the entrance to the road, installing water bars, removing culverts, reestablishing drainage-ways, removing unstable fills, pulling back road shoulders, or other methods designed to meet the specific conditions associated with the unneeded road.

3 Environment and Effects

Costs for road storage and decommissioning are estimated at \$4,000/mile and are based on recent bids received for the POW road storage work (Jacobson personal comm. 2011b). Costs can vary depending on necessary work items, location, fuel prices and other factors. Existing roads that are considered to be stored are surveyed to measure the effectiveness of the storage measures. When necessary, additional storage work may be prescribed to stabilize a road. Table TRAN-5 displays the estimated costs for road storage of the proposed roads and decommissioning of the temporary roads.

Table TRAN-5. Estimated Costs of Road Storage and Decommissioning

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Storage of NFS Roads After Use	\$0	\$106,000	\$202,000	\$78,000	\$73,000
Decommission Temporary Roads	\$0	\$95,000	\$150,000	\$45,000	\$63,000
Total Storage and Decommissioning	\$0	\$201,000	\$352,000	\$123,000	\$136,000

Table TRAN-6 displays the RMOs for the Big Thorne project area based on full implementation of the proposed travel management plan. The RMOs for each existing road are found in the Prince of Wales ATM. The RMOs for proposed roads can be found on the road cards in Appendix C of the Draft EIS as well as the Travel Analysis Report found in Appendix B of the Transportation Resource Report (Barnhart and Hitner 2013b). Final EIS road cards are provided in the project record.

All action alternatives increase the miles of road in storage, Alternative 3 having the largest increase and Alternative 4 having the least increase. No changes were made to the ATM for existing NFS roads.

Table TRAN-6. Travel Management Plan for Project Area NFS Roads after Implementation of Proposed RMOs (miles)

Travel Management	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Open & Maintain	77	77	77	77	77
Open & Maintain With OHV	83	83	83	83	83
Storage	148	154	159	148	149
Seasonal Closure	11	11	11	11	11
Motorized Trail	44	46	47	44	45
Decommission	12	12	12	12	12
Total	375	383	389	375	376

Recreation

Affected Environment

Recreation use in the Big Thorne project area includes freshwater fishing, big game and waterfowl hunting, OHV use, kayaking and canoeing, hiking and wildlife viewing, picnicking, and camping among other activities. The following section is divided into five parts that provide an overview of regional and local tourism and describe Recreation Opportunity Spectrum (ROS) settings, recreation places and sites, OHV use, and outfitter/guide use in the project area.

Tourism

Southeast Alaska

The visitor industry in Alaska is very seasonal, with the majority of visitation taking place between May and September. An estimated 1,064,000 out-of-state visitors came to Southeast Alaska from May 2011 through April 2012, the most recent year that regional data are available, with the majority of these visitors arriving by cruise ship (McDowell Group 2013). In addition to experiencing the Tongass from the deck of the cruise ship and exploring ports of call, many passengers also take at least one trip to the Forest during their visit (McDowell Group 2005). Non-cruise visitors tend to either use package deals designed to provide transportation, lodging, meals, and activities, or visit as independent travelers. Independent travelers tend to design their own travel itineraries, utilize public transportation systems, and stay in local communities. For the majority of Alaska visitors, it is important to experience the natural resources, cultural history, and wildness of the region. The McDowell Group (2013) estimated that total visitor-related employment supported 10,200 jobs and \$370 million in labor income in Southeast Alaska from May 2011 through April 2012, about 21 percent of total regional employment and 15 percent of total labor income. Supplemental analysis of the USDA Forest Service National Visitor Use Monitoring program data estimated that the Tongass received 2.3 million annual visits, with average spending per party of \$287.20. This analysis estimated that every 10,000 visits supported 13.7 direct local jobs (White and Stynes 2010).

Prince of Wales Island

Prince of Wales Island offers world-class fishing and one of the highest populations of black bear in the country, as well as more than 1,500 miles of logging roads, most of which are gravel. The Alaska Marine Highway does not stop at any ports on Prince of Wales Island and large cruise ships, which, as noted above, account for the majority of visitors to Southeast Alaska, do not visit the island either. Most visitors to Prince of Wales Island arrive either by float plane from Ketchikan or via the Inter-Island Ferry between Ketchikan and Hollis. In 2011, a 50- to 75-passenger cruise ship began visiting Prince of Wales Island, stopping at El Capitan Cave, Klawock, and the Naukati West Shellfish Nursery, a private oyster farm in Sea Otter Sound. In 2012, another small cruise boat (25 to 50 passengers) made port calls in Thorne Bay and Kasaan.

An estimated 15,000 out-of-state residents visited Prince of Wales Island in summer 2006, about 1.5 percent of total visitors to Southeast Alaska (McDowell Group 2007). A study by the University of Alaska Institute of Social and Economic Research (ISER) estimated that

3 Environment and Effects

12,326 visitors participated in nature-based tourism on Prince of Wales Island in 2007, bringing in more than \$30 million in gross revenues, with most of this revenue related to sport fishing (Dugan et al. 2009). The majority of this revenue (over 80 percent) comes from the remote lodges on islands scattered around Prince of Wales Island. Craig also has large lodges with this type of clientele. All of these lodges have direct waterfront access and focus on saltwater fishing. These operations are accessed by float plane from the larger communities with jet service (Ketchikan, Wrangell and Petersburg). The experience is self-contained; clients typically do not visit any of the recreation sites in the project area or use the road system (Dugan et al. 2009).

Most sport fish visitors stay in one of the island's lodges, with a smaller number staying in cabins or other local accommodations. Fishing lodges are located in Craig, Klawock, Thorne Bay, and Coffman Cove, as well as in more-remote locations scattered around the island. Sport fish visitors to Craig, Klawock, and the remote lodges focus on saltwater fishing. Lodges and day charter operators in Thorne Bay and Coffman Cove offer a combination of saltwater and freshwater fishing (Dugan et al. 2009).

Bear hunting is popular on the island, with guided black bear hunting and drop-off and transporter services available. The number of visitors and revenues associated with bear hunting are, however, much lower than those associated with sport fishing (Dugan et al. 2009). More than 80 percent of all guided hunts are conducted by motorized boat in shoreline areas; only one guide provides hunting on the Prince of Wales Island road system. The number of hunting guides is limited based on an administrative cap on the number of guided black bear hunts allowed on the Craig and Thorne Bay Ranger Districts (USDA Forest Service 2010b). In addition, no outfitter/guide hunting is allowed in much of the Big Thorne project area based on the Big Game EA closure of the central WAAs (1318 and 1319) on Prince of Wales Island (USDA Forest Service 1993).

The existing road system on Prince of Wales Island offers opportunities for sightseeing and exploring, as well as providing access for hunters and OHV enthusiasts. All roads designated as open under the Prince of Wales Island ATM decision have been identified as important to local users for recreation and subsistence hunting and gathering of firewood. Visitors are able to travel to Prince of Wales Island with their vehicles via the Inter-Island Ferry between Ketchikan and Hollis; access has also been available in the past from Wrangell and Petersburg via limited ferry service to Coffman Cove.

Recreation Opportunity Spectrum

The ROS system is a land classification system developed by the Forest Service to help identify and describe possible combinations of recreation activities, settings, and experiences for management purposes (USDA Forest Service 1982). The ROS system portrays the appropriate combination of activities, settings, and experiences along a continuum that ranges from primitive to highly modified environments. Seven classifications are identified along this continuum:

- § Primitive (P)
- § Semi-Primitive Non-Motorized (SPNM)
- § Semi-Primitive Motorized (SPM)

- § Roaded Natural (RN)
- § Roaded Modified (RM)
- § Rural (R)
- § Urban (U)

ROS classes represent a spectrum of possible experiences, from those with a high probability of self-reliance, solitude, challenge, and risk to those with a relatively high degree of interaction with other people. The settings, activities, and probable recreation experience opportunities associated with each ROS setting are described in Appendix A to the Recreation Resource Report (Dadswell 2013) prepared for this project.

The ROS does not specify or prescribe what types of activities are allowed in an area. The LUDs assigned in the Forest Plan prescribe allowable management activities, along with Federal, State, and local laws and regulations. Therefore, if a LUD allows for increased development, timber harvest, or increased recreation use, then the descriptive ROS character may change to reflect the new development. Since expanded development is allowed within the project area based on the area's LUDs, a change in ROS setting is allowed as a management objective of the existing plan. In addition, changes to existing ROS allocations were anticipated as part of the management objectives and direction incorporated in the Forest Plan (USDA Forest Service 2008a).

The Big Thorne project area encompasses approximately 232,000 acres, including 14,300 acres of non-NFS lands. These non-NFS lands are not included in the ROS analysis, leaving approximately 217,700 acres of NFS land within the project area. More than half (58 percent) of this area has been inventoried as Roaded Modified (RM) (Table REC-1). Community road systems, including the existing networks of Forest Service roads, provide access to developed and dispersed recreation opportunities in these areas. The Semi-Primitive Non-Motorized (SPNM) setting accounts for 32 percent of the project area, with the Primitive (P) and Semi-Primitive Motorized (SPM) settings each accounting for about 5 percent. The areas inventoried as P and SPM, where opportunities for more remote recreation are available, largely coincide with the Thorne River, Karta, and Ratz IRAs, and encompass much of the Honker Divide Canoe Route (Figure REC-1). The remaining land in the project area, less than 1 percent, has been inventoried as Roaded Natural (RN) (0.4 percent), Rural (R) (0.2 percent), and Urban (U) (0.1 percent) (Table REC-1). The RN areas are located along the shoreline near Sandy Beach. The R and U areas are located near and adjacent to the city of Thorne Bay (Figure REC-1).

Table REC-1. ROS Designations within the Big Thorne Project Area

ROS Class	Acres	Percent of Project Area
Primitive (P)	10,509	5
Semi-Primitive Non-Motorized (SPNM)	69,231	32
Semi-Primitive Motorized (SPM)	10,826	5
Roaded Natural (RN)	976	0
Roaded Modified (RM)	125,501	58
Rural (R)	503	0
Urban (U)	133	0
Total	217,679	100

1/ ROS designations are presented for NFS lands within the project area only.

3 Environment and Effects

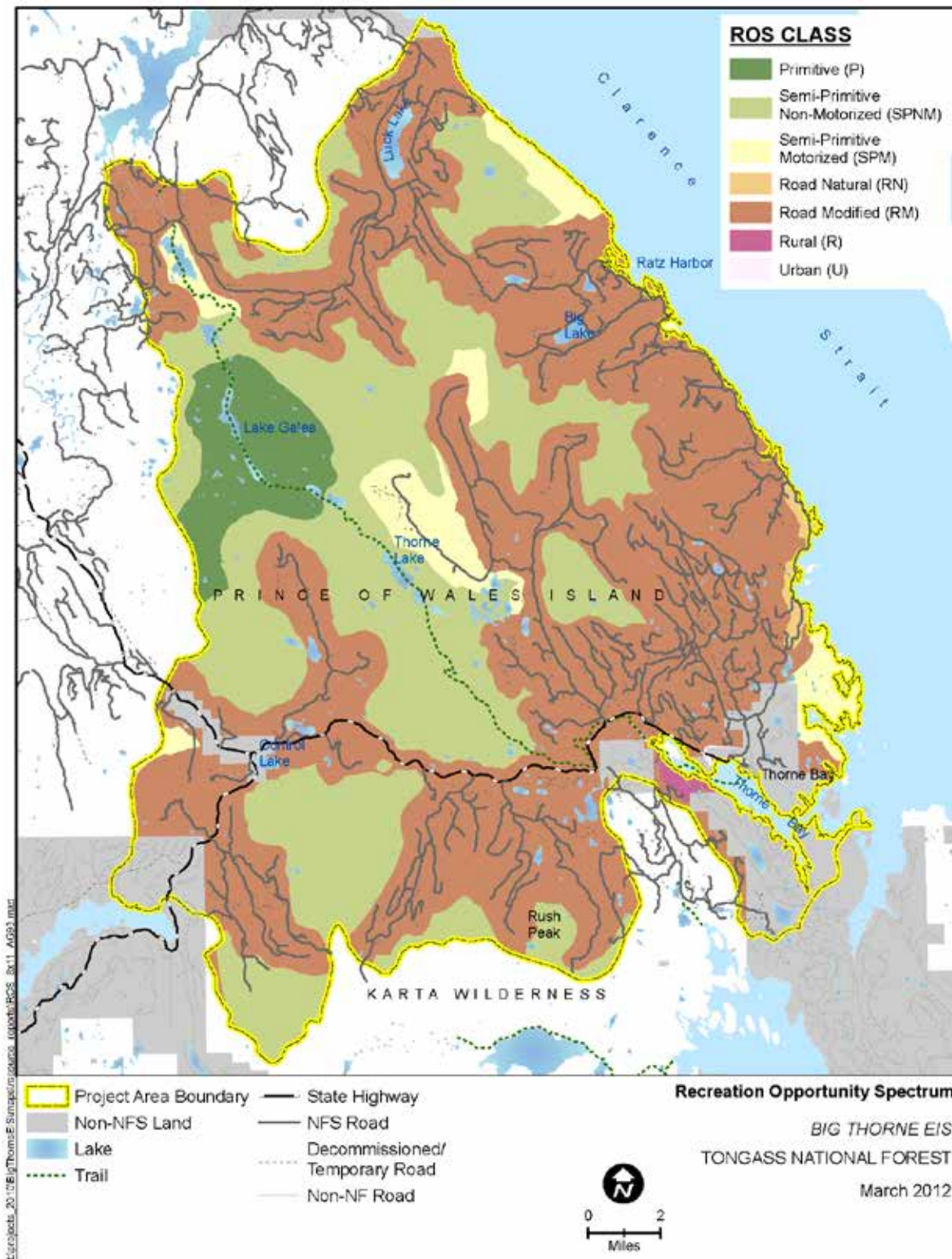


Figure REC-1. Recreation Opportunity Spectrum Settings within the Big Thorne Project Area

Recreation Places and Sites

The majority of the Tongass National Forest is undeveloped and primarily used for dispersed recreation activities. Viewing scenery and wildlife, boating, fishing, beachcombing, hiking, and hunting are the primary dispersed recreation activities that take place on the Forest. While most areas of the Forest have the potential to provide recreation opportunities to a varying degree, patterns of use tend to be associated with existing road systems, known protected boat anchorages, boat landings, and aircraft landing sites. These types of locations, with one or more physical characteristics that are particularly attractive to people for recreation activities, were identified as recreation places as part of the planning analysis for the 1997 Forest Plan and incorporated as part of the process that resulted in the current Forest Plan (USDA Forest Service 2008a).

Four main types of recreation places were identified: marine, hunting, fishing, and tourism (USDA Forest Service 2008a). In the Big Thorne project area, marine recreation places are located at the mouth of Thorne Bay and also extend along the shore from Sandy Beach to Ratz Harbor. Recreation places important for hunting include the road system that extends north of the city of Thorne Bay, as well as portions of the Thorne River and Ratz IRAs.

Fishing recreation places extend along portions of the Thorne River and Hatchery Creek system, and encompass Luck Lake. These areas are also identified as Tourism recreation places, as are the Marine recreation places at Thorne Bay and Ratz Harbor, and the area around Control Lake, Eagles Nest Campground, and Balls Lake Picnic Area.

Recreation sites are specific sites and/or facilities where recreation activities are localized. Recreation sites include, but are not limited to, developed recreation sites such as trails, picnic sites, campsites, interpretive sites, and Forest Service cabins. They also include undeveloped sites with significant natural features like waterfalls or geologic formations that are destinations for National Forest visitors. Like recreation places, developed and undeveloped recreation sites on the Tongass were identified as part of the planning process for the 1997 Forest Plan. Developed recreation sites are identified by name in Figure REC-2. Recreation sites are discussed in the following sections.

Developed Recreation Sites

Thirteen developed recreation sites are located in the Big Thorne project area (Table REC-2). The locations of 10 of these sites are identified on Figure REC-2. The three sites not labeled on the map are the Falls Creek Fishing Access point, the Boyscout Multiuse Trail, and the Cutthroat Road Trail.

The Forest Service does not charge fees for recreation sites or trails, other than the cabin reserve system, and there are no trail counters or other devices to calculate use at these locations. As a result, there is no systematic estimation of use for most recreation areas on the Thorne Bay Ranger District. For the purposes of this analysis, each of the developed recreation sites within the project area was assigned a rating of high, medium, or low use by the Recreation Planner for the Craig and Thorne Bay Ranger Districts based on observations and professional judgment (Table REC-2). The following sections provide summary information for each of the 13 developed recreation sites identified in the Big Thorne project area.

3 Environment and Effects

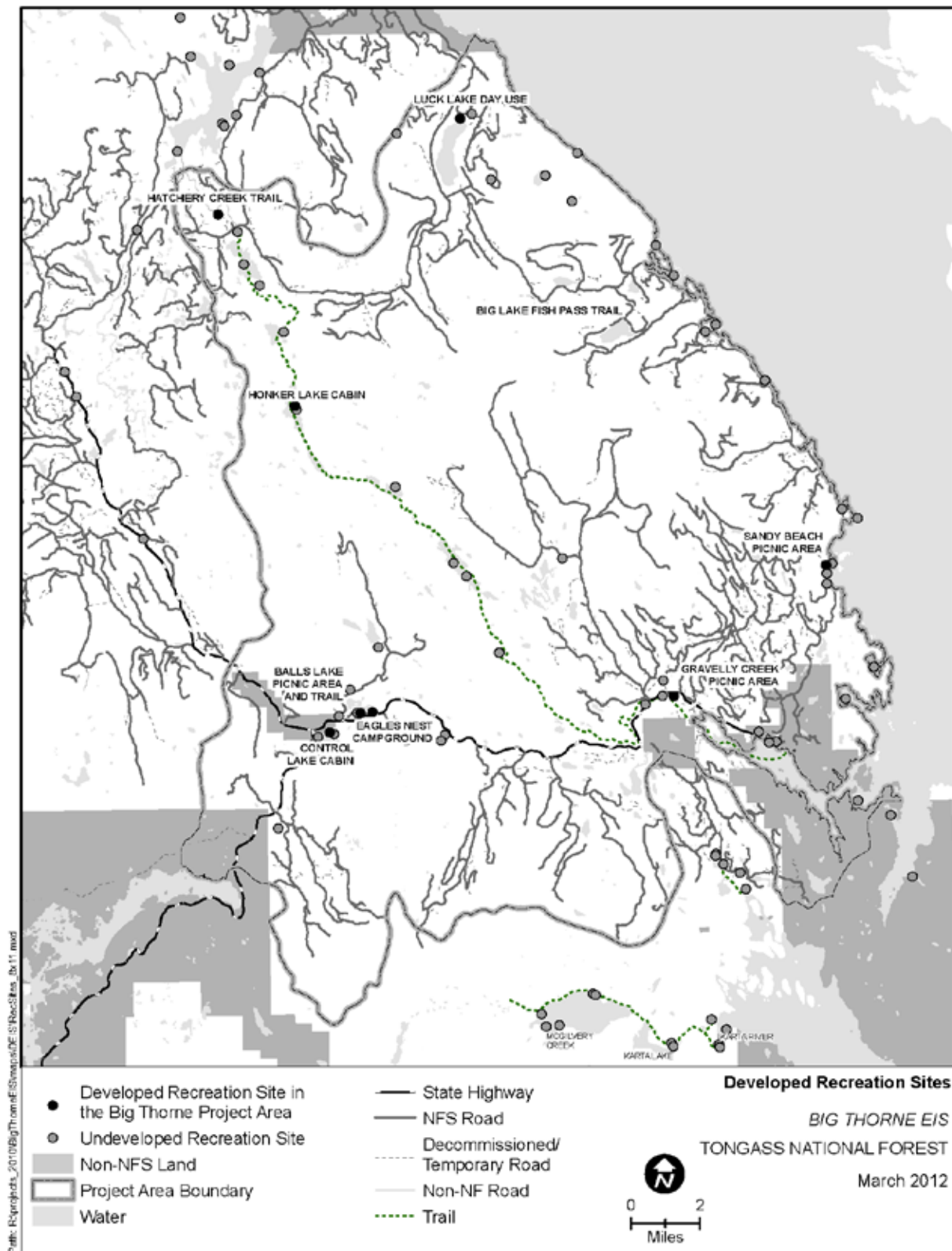


Figure REC-2. Recreation Sites in the Big Thorne Project Area

Table REC-2. Developed Recreation Sites in the Big Thorne Project Area

Site Name	Description	Site Use Rating ^{1/}
Gravelly Creek Picnic Area	Large day-use area with fishing access to Gravelly Creek and Thorne River	High
Sandy Beach Picnic Area	Large day-use area with beach and water access	High
Honker Divide Canoe Route	30-mile-long canoe route and hiking trail on the Hatchery Creek/Thorne River system	Low
Eagles Nest Campground	Campground with 12 sites and a short interpretive trail	Medium
Balls Lake Picnic Area and Trail	Picnic area with a community shelter and 2.2 mile trail around the lake	Low
Fishing Access Falls Creek	Fishing access at the confluence of Thorne River and Falls Creek	High
Luck Lake Day Use	Primitive boat launch on the north end of Luck Lake	Medium
Big Lake Fish Pass Trail	Short gravel trail to fish passage viewing area	Low
Boyscout Multiuse Trail	OHV trail system	Medium
Cutthroat Road/Trail	5-mile-long road/trail closed to motorized use; used by hikers, bikers, and skiers	Medium
Hatchery Creek Trail	0.5-mile-long boardwalk trail to Hatchery Creek Falls	High
Honker Lake Cabin	Recreation cabin on the northeast side of Honker Lake	**
Control Lake Cabin	Recreation cabin on the north shore of Control Lake	**

Notes:

1/ High is over 500 visitors per year, medium is estimated at 100-500, and low is anything under 100 visitors per year. Estimates are based on extrapolations from limited informal observations in the field.

** Use for recreation cabins is recorded by reserved nights at each cabin. In 2008, the Honker Lake and Control Lake cabins were reserved for 27 nights and 69 nights, respectively. These totals were generally consistent with the average number of reservations at these cabins from 2004 to 2008.

Source: USDA Forest Service 2011h

Gravelly Creek Picnic Area

A large day use picnic area located about 3 miles from the city of Thorne Bay (adjacent to State Highway 929), this site provides fishing access to Gravelly Creek and the Thorne River. A short wheelchair-accessible trail leads from a paved parking area to the river where there are several picnic sites, restrooms, and a shelter. Four species of salmon, rainbow and cutthroat trout, Dolly Varden char and spring and fall runs of steelhead occur in the Thorne River. Recreation use at this site is considered high (Table REC-2).

Sandy Beach Picnic Area

A large day use, picnic area located about 6 miles north of the city of Thorne Bay, this site is situated among a stand of Sitka spruce and cedar adjacent to Sandy Beach. Picnic area facilities include a shelter and restroom facilities. Visitors use the beach and enjoy the view of Clarence Strait. Sandy Beach Picnic Area is a popular location and use is considered high (Table REC-2).

Honker Divide Canoe Route

The Honker Divide Canoe Route starts at the Hatchery Creek Bridge on Coffman Cove Road (Forest Road 30) and travels southeast over 30 miles of streams and lakes in the Hatchery Creek/Thorne River system before ending at the city dock in the city of Thorne Bay. Thorne River and Hatchery Creek are connected by a low divide that affords a 2- to 3-mile canoe portage. The Honker Divide Canoe Route is entirely located within the Big Thorne project area.

3 Environment and Effects

Fishing opportunities on the Thorne-Hatchery system are nationally known. The area receives extensive use as a recreational fishery for a variety of species, including coho, sockeye, chum, and pink salmon, as well as cutthroat, rainbow, and steelhead trout and Dolly Varden char. Thorne River produces the largest run of steelhead on Prince of Wales Island and is considered one of five high-quality freshwater fishing areas on the island. Opportunities for wildlife viewing are also a draw and subsistence hunting is a common activity in the surrounding area.

The Honker Divide Canoe Route is part of the Thorne River/Hatchery Creek/Barnes Lake, which was recommended for inclusion in the Wild and Scenic River System during the 1997 Forest Plan revision. This river was recommended for the following outstandingly remarkable values: scenery, recreation, fish, and wildlife (see the Wild and Scenic Rivers section, below).

Compared to some of the other developed recreation areas in the Big Thorne project area, the Honker Divide Canoe Route receives relatively low levels of use (Table REC-2). However, this type of comparison is somewhat misleading because the Honker Divide Canoe Route offers a challenging, remote recreation experience that relies upon limited encounters with other parties.

Eagles Nest Campground

Located on Balls Lake, about 16 miles west of Thorne Bay on State Highway 929, Eagles Nest Campground has 12 campsites, restroom facilities, an accessible interpretive trail, and a boat launch on Balls Lake for canoes or kayaks. There are also opportunities to fish for trout and Dolly Varden from the shore. Recreation use at this location is considered medium (Table REC-2).

Balls Lake Picnic Area and Trail

Also located on Balls Lake, this picnic area is located about 0.5 mile from the Eagles Nest Campground. The picnic area includes two picnic tables, a large community shelter, and a vault toilet. The trailhead for the 2.2-mile Balls Lake Trail is located near the shelter. Day users can also follow a 0.5-mile trail to Eagles Nest Campground, interpretive trail, and boat launch. Recreation use at this location is considered low (Table REC-2).

Fishing Access Falls Creek

This is a widened pull-off for parking along the Thorne Bay Highway (State Highway 929). A somewhat hardened, 500-foot trail leads from the pull-off to the confluence of the Thorne River and Falls Creek. This is a popular location for fishing access and recreation use at this location is considered high (Table REC-2).

Luck Lake Day Use Area

This area consists of a primitive boat launch and small parking area that provide access to the north end of Luck Lake. Located about 6 road miles south of Coffman Cove, this area is used by canoeists and kayakers. There is also a swimming area near the access site, and people fish the lake for sockeye salmon and cutthroat and lake trout. Recreation use at this location is considered medium (Table REC-2).

Big Lake Fish Pass Trail

This short, accessible gravel trail takes visitors to a platform viewing area that overlooks a fish ladder on Ratz Creek. Interpretive signs provide information about the life cycle of salmon and fish passage. During the late summer and fall salmon runs, visitors can see salmon leap up the fish pass. This trail is located about 22 road miles north of Thorne Bay. Recreation use at this location is considered low (Table REC-2).

Boyscout Multiuse Trail

The Boyscout Multiuse Trail is an old road system (3017-3018 Roads) that has been closed to highway vehicles but left open for OHV use, with an 85-foot-long OHV bridge installed in the mid-1990s. Easily accessible from Thorne Bay, the trail climbs in elevation and provides views of Clarence Strait. Recreation use at this location is considered medium (Table REC-2).

Cutthroat Road/Trail

Cutthroat Road/Trail is a relatively flat, higher elevation former logging road that is gated, preventing motor vehicles from entering. This 5-mile-long road/trail is used by walkers, bikers, and skiers. Recreation use at this location is considered medium (Table REC-2).

Hatchery Creek Trail

This 0.5-mile-long boardwalk trail leads to Hatchery Creek Falls. The falls offer opportunities for salmon fishing and wildlife viewing. Recreation use at this location is considered high (Table REC-2).

Honker Lake Cabin

Located on the northeast side of Honker Lake (also known as Lake Galea), about 6 miles downstream of the put-in location for the Honker Divide Canoe Route, this Forest Service cabin is isolated and accessible only by floatplane or canoe. Waterfowl are abundant, especially the Canada goose or “honker.” There is good fishing in the lake for cutthroat, rainbow, and Dolly Varden trout, as well as coho and sockeye salmon; Sitka black-tailed deer, black bear, and wolves are often sighted here. Consistent with its remote location, the Honker Lake Cabin receives relatively low levels of use, with 27 nights reserved in 2008.

Control Lake Cabin

This cabin, located on the north shore of Control Lake, is about 18 road miles from Thorne Bay and accessed from State Highway 929. The Lower Thorne River, which offers fishing and boating opportunities, is located a short drive away and the cabin is a popular staging location for recreation activities in the area. The lake has resident populations of cutthroat and Dolly Varden trout and sockeye salmon. The Control Lake Cabin receives relatively high use, with 69 nights reserved in 2008.

Undeveloped Recreation Sites

In addition to the developed recreation sites discussed above, the planning process for the 1997 Forest Plan identified a number of undeveloped recreation locations in the Big Thorne project area (Figure REC-2). These locations include sites that are recognized sites for undeveloped recreation opportunities, including hunting and fishing, as well as

3 Environment and Effects

sites that offer developed recreation facilities that are not managed or maintained by the Forest Service. There are also two developed sites in the project area not managed by the Forest Service: the old Colby Cabin, a non-Forest Service cabin on the Honker Divide Canoe Route, which is popular with Honker Divide users; and the boat launch at Ratz Harbor, used for small boats to access Clarence Strait.

Other undeveloped sites identified on Figure REC-2, include a series of locations along the Honker Divide Canoe Route that have been identified as good fishing spots. The locations identified along Sandy Beach Road (Forest Road 30) represent popular beaches, many with hammocks and fire pits established by local users. Other undeveloped sites shown on Figure REC-2 mainly provide opportunities for dispersed recreation opportunities, including fishing and hunting. Other recreation sites in the project area not identified on Figure REC-2 include well-beaten, user-made paths along the lower Thorne River that provide access to fishing opportunities.

Table REC-3 lists a number of the undeveloped recreation sites in the project area that have been identified as receiving consistent use in recent years. The table also presents approximate estimates of site use based on the site rating criteria used to evaluate the developed sites in Table REC-2, above.

Table REC-3. Estimated Use of Undeveloped Recreation Sites in the Big Thorne Project Area Identified as Receiving Consistent Use

Site Name	Site Use Rating ^{1/}
Steelhead Gravel Pit	Medium
301500 Pit	Medium
Eightmile Fishing Hole	Medium
Goose Creek Fishing Hole	High
Thorne River Bridge	High
North Thorne Falls	Medium
Snakey Lakes	Low
Thorne River Trapper's Cabin ^{2/}	Low
Lava Creek Multiuse Trail	Medium
Tory Shores Beach	Low
Sal Creek Beach	Low
Sandy Beach North	Medium
Eagle Creek	Medium
Luck Creek	Medium

Notes:

1/ High is over 500 visitors per year, medium is estimated at 100-500, and low is anything under 100 visitors per year. Estimates are based on extrapolations from limited informal observations in the field.

2/ This cabin is also known as the old Colby Cabin.

Source: USDA Forest Service 2011h

Off-Highway Vehicle Use

The extensive road system in the project area offers opportunities for OHV use. While State of Alaska OHV laws state that OHVs may not be used on any State highway or open road connected to a state highway, OHV use is a common mode of access on Prince of Wales Island. OHVs travel almost entirely on the hardened road surfaces on Prince of Wales Island. The Forest Service recently addressed OHV use on the island, as well as other road management objectives, through the ATM process. The Environmental

Assessment prepared for this process indicated that there has been an increase in the number of OHV users on Prince of Wales Island in recent years, which has led to the development of the Prince of Wales Island Off-Road Vehicle Club (USDA Forest Service 2009a).

The RMOs for the existing roads in the Big Thorne project area include 105 miles of road open and maintained with OHV use and 44 miles of motorized trail for OHV use. Popular locations for OHV use in the Big Thorne project area include the Boyscout Multiuse Trail (about 16 miles long). The Steelhead and North Thorne road systems (approximately 12 miles and 50 miles long, respectively) are also popular for hunting and driving. All roads designated as open under the ATM process have been identified as important to local users for recreation and subsistence hunting and gathering of firewood.

Special Use Permits and Outfitter/Guide Use

A recent Recreation Visitor Capacity Analysis prepared for the Craig and Thorne Bay Ranger Districts identified 186 locations on these Districts used by outfitters and guides between 2004 and 2008. Eight of these locations are in the Big Thorne project area (Table REC-4). Between 2004 and 2008, a total of 1,741 days of use were recorded at these eight locations, with total use over this period ranging from just 3 clients at Angel Lake to 867 clients on Thorne River (USDA Forest Service 2010b). Fishing was the only recorded activity at five of the eight locations, and accounted for the vast majority of the location days at the other three locations, Thorne River, Eagle Creek, and Ratz Creek (Table REC-4).

Viewed in terms of the 186 locations identified on Prince of Wales and surrounding islands, Thorne River ranked second in terms of total recorded location days between 2004 and 2008, with Luck Lake and Hatchery Creek ranked ninth and tenth, respectively (USDA Forest Service 2010b). An EA is currently being undertaken to determine the amount of outfitter and guide use to allow within the Craig and Thorne Bay Ranger Districts.

Table REC-4. Outfitter and Guide Locations and Use in the Big Thorne Project Area

Outfitter and Guide Location	2004–2008			
	Total Use^{1/}	Fishing^{1/}	Camping^{1/}	Hunting^{1/}
Thorne River	867	861	6	0
Luck Lake	248	248	0	0
Hatchery Creek	240	240	0	0
Eagle Creek	188	170	18	0
Trumpeter Lake	110	110	0	0
Ratz Creek	80	62	6	12
Big Lake	5	5	0	0
Angel Lake	3	3	0	0

Note:

1/ Use is reported in location days; a location day represents one client in one location, regardless of the time spent on NFS lands.

USDA Forest Service 2010b

3 Environment and Effects

Environmental Consequences

The analysis area for direct, indirect, and cumulative effects to recreation is the Big Thorne project area. Effects are assessed in terms of changes in the ROS settings in the project area, as well as potential impacts to Recreation Places and Sites, OHV Use, and Special Use Permits and Outfitter/Guide Use. Changes in ROS settings are quantified in acres; other potential impacts are discussed in qualitative terms.

Recreation Opportunity Spectrum

The distribution of ROS settings in the project area would change under all of the action alternatives (Table REC-5). Viewed in terms of the project area, the resulting changes would represent a small share of the affected settings under any of the alternatives. Change to existing ROS settings would occur where land allocated to the SPNM and SPM ROS settings is within 0.5 mile of a new system or temporary road. Changes would also occur to areas currently allocated to the RN ROS setting. These areas would all change to RM. In addition, harvest units in SPNM would also change to RM because the SPNM setting is not a compatible ROS class for areas with timber harvest. Change from a more primitive ROS represents a change in recreation resources in the affected areas. People are likely to have a different type of experience in these sites following timber harvest. More visitors may be able to access these locations due to harvest-related developments. More use is likely to lead to more encounters, which is consistent with a more developed ROS.

Table REC-5. ROS Settings by Alternative

ROS Setting	Alternative (acres)				
	1	2	3	4	5
Primitive (P)	10,509	10,509	10,509	10,509	10,509
Semi-Primitive Non-Motorized (SPNM)	69,231	67,492	66,372	68,489	68,478
Semi-Primitive Motorized (SPM)	10,826	10,392	7,804	10,709	10,593
Roaded Natural (RN)	976	387	232	974	956
Roaded Modified (RM)	125,501	128,263	132,125	126,362	126,507
Rural (R)	503	503	503	503	503
Urban (U)	133	133	133	133	133
Grand Total	217,679	217,679	217,679	217,679	217,679
<i>Net Change in Acres</i>					
SPNM to RM	0	1,739	2,859	742	753
SPM to RM	0	434	3,022	117	233
RN to RM	0	589	744	2	20
Total Acres Changed to RM	0	2,762	6,624	861	1,006

Recreation Places and Sites

The action alternatives could potentially result in short- and long-term impacts to recreation places and sites. Short-term impacts would result from the presence of crews and equipment on roads in the project area, which may have temporary impacts on recreation access, as well as the quality of the recreation experience for affected users. Impacts would also occur in the areas directly affected by new road construction, reconstruction of existing roads, and timber harvest activities. The presence of road building and logging crews and the noise associated with their activities are likely to

affect the quality of the recreation experience in adjacent and nearby areas. These types of impacts would generally be limited to the immediate area of activity and limited in duration. Recreation users engaged in dispersed recreation activities, like hunting, fishing, and OHV use, would likely be temporarily displaced to other similar locations in the general vicinity.

Long-term impacts could result from changes in access, particularly where new system roads would remain open for a period of years following harvest to allow for wood gathering and other uses. Long-term impacts would also result from changes in scenery as a result of harvest activities. These impacts are more likely to occur in old-growth harvest units because commercial thinning of young growth units is not expected to have long-term impacts to scenery. Impacts to scenery are addressed in the Scenery section of this document.

Developed Recreation Sites

Thirteen developed recreation sites are located within the Big Thorne project area (Table REC-2; Figure REC-2). With the exceptions of the Honker Divide Canoe Route and Honker Lake Cabin, these sites are all accessed from the existing road system. Most of these sites would experience short-term impacts from the presence of road building and logging crews and equipment on nearby roads, as well as from log trucks. In addition, harvest units are proposed in relative proximity to several of these sites under one or more of the action alternatives. These sites are discussed below.

Gravelly Creek Picnic Area

Timber harvest is proposed across State Highway 929 from the Gravelly Creek Picnic Area. Although located on a slope facing the road, the proposed harvest unit is unlikely to be visible from the picnic area because of the vegetation screening on both sides of the highway. Noise and other activity associated with harvest in this area, which includes temporary road construction, would be apparent to people using the picnic area. These impacts would occur under all of the action alternatives and would be temporary.

Sandy Beach Picnic Area

Timber harvest is proposed across Sandy Beach Road (Forest Road 30) from the Sandy Beach Picnic Area. The proposed harvest units are not expected to be visible from the picnic area, mainly due to vegetation screening and local topographic relief. Further, recreation activities at this picnic area are oriented toward the beach and Clarence Strait, away from the proposed harvest units. However, noise and other activity associated with harvest near this area, which includes temporary road construction, would likely be apparent to people using this picnic area. Log trucks using Sandy Beach Road would also be apparent to people using this area.

Harvest would occur in these units under Alternatives 2 and 3 using ground-based logging systems. Under Alternative 4, the proposed harvest units would become part of a new Old Growth Reserve. The units would be helicopter logged under Alternative 5.

Honker Divide Canoe Route

Timber harvest, road reconstruction, and new road construction is proposed off the 3015 road, north of State Highway 925 under Alternatives 2 through 4. Harvest would occur in

3 Environment and Effects

this area under Alternative 5, but would only involve limited road construction, as the units closest to the Canoe Route would be helicopter logged. These harvest units are located outside the Thorne River IRA. Activity in these areas is unlikely to be visible from the Canoe Route and there are no associated scenery concerns. Noise generated by logging and road construction/reconstruction could be audible to recreationists traveling the Canoe Route and would likely affect the quality of their remote recreation experience. Helicopter logging under Alternative 5 would be apparent to recreationists traveling the Canoe Route and would affect the quality of their recreation experience. These impacts would be temporary.

Additional harvest near the Canoe Route is proposed under Alternative 3. Under this alternative, harvest would occur along Honker Road, northeast of Thorne Lake. Limited road construction would be required in this area, and a small part of the overall harvest area would be logged by helicopter. Four of the proposed units, located between 0.75 and 1 mile from the river corridor, could be partially visible from some portions of the lakes along the Honker Divide Canoe Route. Harvest in these areas is not expected to affect the quality of the recreation experience along the Canoe Route. Noise and other activity associated with harvest in this area would, however, be apparent to people traveling this part of the Canoe Route and would affect the quality of their remote recreation experience. These impacts would be temporary.

Eagles Nest Campground and Balls Lake Picnic Area and Trail

No harvest units are proposed in the immediate vicinity of these recreation sites under any of the action alternatives. Units are proposed across the Craig Thorne Bay Highway from these sites and sounds of timber harvest activities would be heard by campers and day use site visitors.

Fishing Access Falls Creek

This site, located near the Gravelly Creek Picnic Area, would experience similar impacts to the picnic area. These impacts would occur under all of the action alternatives and would be temporary.

Luck Lake Day Use Area

Old-growth timber harvest is proposed near this day use area under Alternatives 2, 3, and 5. Alternatives 3 through 5 include young-growth units that follow Forest Road 3030 and extend along the entire length of the west side of the lake. In addition, Alternative 3 includes harvest units in the OGR located immediately north of the lake. Noise and other activity associated with harvest in this area would be apparent to people using the day use area and recreating on the lake. Harvest in the old-growth units near the lake would also have long-term impacts to the scenery in this area as viewed from the day use area and lake. Commercial thinning of young-growth units is not expected to have long-term impacts to scenery.

Big Lake Fish Pass Trail

Timber harvest is proposed in the vicinity of this trail under all of the action alternatives. Alternatives 3 through 5 include young-growth units located either side of the road that provides access to the trail. Harvest in these areas would likely require temporary closure

of this road to allow safe access for logging equipment and crews and would block access to the trail. These impacts would be temporary. Impacts to scenery are discussed in the Scenery section of this document.

Boyscout Multiuse Trail

Parts of the old road systems (3017-3018 Roads) that comprise the Boyscout Multiuse Trail would be used to access proposed harvest units under all of the action alternatives. This is especially the case under Alternatives 3 through 5, which include young-growth units along Forest Road 3018. Harvest in these areas would likely require temporary closure of these roads to allow safe access for logging equipment and crews and would block access to the trail. Logging activity in nearby areas would also be apparent to users of the Boyscout Multiuse Trail. These impacts would be temporary. A number of roads that branch off Forest Road 3018 would require reconstruction, but Forest Road 3018 itself would not need any reconstruction work.

Logging could also result in some long-term impacts to scenery in old-growth units near the trail, which could affect the quality of the OHV recreation experience. Commercial thinning in young-growth areas along the road system is not expected to have long-term impacts to scenery.

Control Lake Cabin

No harvest units are proposed in the immediate vicinity of this recreation site under any of the action alternatives. The closest proposed harvest unit is located the other side of the lake and across Control Lake-Klawock highway. Some timber harvest planned for units across the state highway would be partially visible in the background or middleground (see Scenery Section) and audible from across Control Lake.

Other Developed Recreation Sites

No harvest units are proposed in the vicinity of the other developed recreation sites in the Big Thorne project area—Cutthroat Road/Trail, Hatchery Creek Trail, and Honker Lake Cabin—under any of the alternatives. These sites are, therefore, not expected to be affected under any of the alternatives.

Undeveloped Recreation Sites

With the exception of the undeveloped recreation sites along the Honker Divide Canoe Route, the majority of the undeveloped recreation sites discussed in the Affected Environment section are accessed from the existing road system (Figure REC-2). Most of these sites would experience short-term impacts from the presence of road building and logging crews and equipment on nearby roads, as well as from log trucks. Long-term impacts to these sites would primarily result from changes to scenery, which could potentially affect the quality of the recreation experience, especially in more remote areas where harvest has not occurred in the recent past. Impacts to scenery are evaluated in the Scenery section of this document. Impacts to undeveloped sites along the Honker Divide Canoe Route would be similar to those discussed for the Canoe Route as a whole, above.

Implementation of the applicable Forest Plan standards and guidelines and BMPs would mitigate potential impacts to fisheries. As a result, none of the alternatives are expected to

3 Environment and Effects

have measurable effects on fish habitat and are, therefore, unlikely to affect sport fishing or businesses that focus on sport fishing.

Off-Highway Vehicle Use

Potential impacts to road systems that receive recreational OHV use in the project area are likely to be similar to those described above for the Boy Scout Multiuse Trail. The action alternatives would likely require temporary closure of parts of the road/trail system to allow safe access for logging equipment and crews. Logging activity in nearby areas would be apparent to users of this road/trail system. Long-term visual impacts could result from harvest in nearby old-growth units, but much of the area adjacent to these roads has been harvested in the past. Commercial thinning in young-growth areas along the road system under Alternatives 3 through 5 is not expected to have long-term impacts to scenery.

Most of the new roads proposed under the action alternatives would be temporary and would be decommissioned after timber harvest and hauling is completed. Some of the new roads would be system roads and would remain seasonally open (May 1 to November 30) for 1 to 5 years to allow for firewood removal. These new roads would be seasonally open to highway legal vehicles only and would not provide additional OHV opportunities. However, full implementation of the proposed RMOs for the proposed roads would result in a small increase in the miles of motorized trail suitable for OHV use in the project area under all four action alternatives. There would be no changes to the ATM for existing NFS roads.

Special Use Permits and Outfitter/Guide Use

Eight locations in the Big Thorne project area are currently authorized for outfitter/guide use under special use permits. These locations are identified in Table REC-4. Fishing was the primary outfitter/guide activity at all seven locations. Increased traffic and temporary road closures could have an impact on the locations that outfitter/guides choose for access. These impacts would be localized and temporary. None of the proposed alternatives are expected to result in long-term impacts to the ability of outfitter/guides to use these areas.

Alternative 1 – No Action

Direct and Indirect Effects

Alternative 1 would have no direct or indirect effects on recreation because there would be no timber harvest or road construction/reconstruction under this alternative.

Cumulative Effects

Alternative 1 would have no cumulative effects on recreation because there would be no timber harvest or road construction/reconstruction under this alternative.

Alternative 2 – Proposed Action**Direct and Indirect Effects**

Under Alternative 2, a total of 1,739 acres would change from the SPNM ROS setting to RM (Table REC-5). This represents approximately 3 percent of the 69,231 acres currently allocated to SPNM in the project area. In addition, an estimated 434 acres would change from the SPM ROS setting to RM and 589 acres would change from the RN ROS setting to RM; these changes represent approximately 4 percent and 60 percent of the total acres in the project area currently allocated to these ROS settings, respectively (Table REC-5).

This alternative would result in short-term impacts to recreation places and sites, as described in the Recreation Places and Sites section, above. This alternative does not include young-growth thinning and would harvest fewer total acres than the other action alternatives (Alternatives 3 through 5). It would harvest fewer old-growth acres than Alternative 3, more than Alternative 4, and nearly the same amount as Alternative 5. Long-term impacts to recreation places and sites would primarily be related to changes in scenery.

Alternative 2 would have short-term impacts on OHV users, as described in the Off-Highway Vehicle Use section, above. There would be no increase in the miles of roads/trails available for OHV use in the short-term under this alternative. Full implementation of the proposed RMOs for proposed roads would result in a small increase (3 miles) in the miles of motorized trail suitable for OHV use.

This alternative would have short-term impacts on outfitter/guide use, but is not expected to have long-term impacts on the ability of outfitter/guides to use currently permitted locations.

Recreation use patterns in the project area are not expected to change greatly as a result of this alternative because the popular recreation sites in the project area would not experience long-term effects and access to fishing and hunting activities is likely to remain relatively consistent. Potential impacts to wildlife populations and the availability of hunting and fishing species are summarized above and addressed in more detail in the Issue 3: Wildlife and Subsistence Use and Fisheries sections of this document.

Cumulative Effects

The existing road systems and harvested areas have heavily influenced the character and value of recreation use in the Big Thorne project area. Past land management activities in the area have involved moderate to intensive timber management and road development. The influence of these activities on recreation opportunities in the area is reflected in the current ROS settings shown in Figure REC-1. Remote recreation opportunities are primarily available in the IRAs, which comprise about 40 percent of the project area. The roaded parts of the project area are mainly allocated to the RM setting. Harvest and road building activities proposed under this alternative are located outside the existing IRAs and, as noted above, would result in a reduction in SPNM, SPM, and RN acres in the project area (Table REC-5).

The reasonably foreseeable projects identified in the project area would also be largely concentrated outside the IRAs in the project area. As a result, this alternative is not

3 Environment and Effects

expected to contribute to long-term changes to overall patterns of recreation use in the project area. Existing opportunities would continue to be available for those seeking remote and primitive recreation experiences, and those seeking access to fishing and hunting opportunities would continue to have those opportunities.

Short-term cumulative impacts could occur if one or more of the reasonably foreseeable projects were to coincide in time and space with the project. This could result in additional temporary disruptions to recreation use and could affect the quality of the recreation experience in localized areas. These types of impacts would be limited to the duration of road building and harvest activities in a particular location.

Alternative 3

Direct and Indirect Effects

Under Alternative 3, a total of 2,859 acres would change from the SPNM ROS setting to RM (Table REC-5). This represents approximately 4 percent of the 69,231 acres currently allocated to SPNM in the project area. In addition, an estimated 3,022 acres would change from the SPM ROS setting to RM and 744 acres would change from the RN ROS setting to RM; these changes represent approximately 28 percent and 76 percent of the total acres in the project area currently allocated to these ROS settings, respectively (Table REC-5).

This alternative would result in short-term impacts to recreation places and sites, as described in the Recreation Places and Sites section, above. Alternative 3 would harvest more total acres (old growth and young growth) than the other action alternatives (Alternatives 2, 4, and 5), ranging from 1.3 times (Alternative 5) to 1.9 times as many (Alternative 2). This alternative would also require more road construction and reconstruction.

Assuming that short-term impacts to recreation sites and places would increase with the amount of logging and road building, impacts resulting from temporary closures to road and trail systems to allow safe access for logging equipment and crews would likely be higher under this alternative than under the other action alternatives. This would also be the case with other impacts related to the presence of road building and logging activities.

Logging activities may also be more apparent to recreation users under this alternative than under Alternative 2 because this alternative involves commercial thinning of young-growth units, which tend to be located closer to existing road systems than old-growth stands. Commercial thinning in young-growth areas is expected to have short-term impacts on recreation. In addition, the commercial thinning prescribed under this alternative may increase the deer forage in the area and provide more opportunities for hunting. Impacts to deer are discussed in the Issue 3: Wildlife and Subsistence Use section of this document. This alternative includes a larger area of commercial thinning than Alternatives 4 and 5, the other alternatives that have a commercial thinning component.

Alternative 3 has the potential to affect recreation users traveling the Honker Divide Canoe Route because it includes harvest units and road building along Honker Road,

northeast of Thorne Lake. These potential impacts are discussed further in the Recreation Places and Sites section, above.

Alternative 3 would have short-term impacts on OHV users, as described in the Off-Highway Vehicle Use section, above. Logging activities may be more apparent to OHV users under this alternative than under Alternative 2 because it involves commercial thinning of young growth along existing road systems that are used by OHVs. Short-term road closures would also be required on some popular OHV trail systems. There would be no increase in the miles of roads/trails available for OHV use in the short term under this alternative and full implementation of the proposed RMOs for proposed roads would result in a small increase (4 miles) in the miles of motorized trail suitable for OHV use.

This alternative would have short-term impacts on outfitter/guide use, but is not expected to have long-term impacts on the ability of outfitter/guides to use currently permitted locations.

Recreation use patterns in the project area are not expected to change greatly as a result of this alternative because the popular recreation sites in the project area would not experience long-term effects and access to fishing and hunting activities is likely to remain relatively consistent. Potential impacts to wildlife populations and the availability of hunting and fishing species are addressed in the Issue 3: Wildlife and Subsistence Use and Fisheries sections of this document.

Cumulative Effects

Harvest and road building activities proposed under this alternative are located outside the existing IRAs and, as noted above, would result in a reduction in SPNM, SPM, and RN acres in the project area (Table REC-5).

In conjunction with other reasonably foreseeable projects, this alternative is not expected to contribute to long-term changes to overall patterns of recreation use in the project area. Existing opportunities would continue to be available for those seeking remote and primitive recreation experiences and those seeking access to fishing and hunting opportunities would continue to have those opportunities.

Short-term cumulative impacts could occur if one or more of the reasonably foreseeable projects were to coincide in time and space with the project. This could result in additional temporary disruptions to recreation use and could affect the quality of the recreation experience in localized areas. These types of short-term cumulative impacts would likely be larger under Alternative 3 because more acres would be harvested and more miles of road would be constructed and reconstructed under this alternative.

Alternative 4

Direct and Indirect Effects

Under Alternative 4, a total of 742 acres would change from the SPNM ROS setting to RM (Table REC-5). This represents approximately 1 percent of the 69,231 acres currently allocated to SPNM in the project area. In addition, an estimated 117 acres would change from the SPM ROS setting to RM, and 2 acres would change from the RN ROS setting to

3 Environment and Effects

RM; this change from SPM to RM represents approximately 1 percent of the total acres in the project area currently allocated to the SPM ROS setting (Table REC-5).

This alternative would result in short-term impacts to recreation places and sites, as described in the Recreation Places and Sites section, above. Alternative 4 would involve the lowest amount of old-growth harvest among the action alternatives, and would thin fewer acres of young growth than Alternatives 3 and 5. Long-term impacts to recreation places and sites would primarily be related to changes in scenery. These impacts are discussed in the Scenery Resource Report (Evans 2013).

Logging activities may also be more apparent to recreation users under this alternative than under Alternative 2, because this alternative involves commercial thinning of young-growth units, which tend to be located closer to existing road systems than old-growth stands. Commercial thinning in young-growth areas is expected to have short-term impacts on recreation. In addition, the commercial thinning prescribed under this alternative may increase the deer forage in the area and provide more opportunities for hunting. Impacts to deer are discussed in the Issue 3: Wildlife and Subsistence Use section of this document. This alternative involves fewer commercial thinning acres than Alternative 3 and more than Alternative 5.

Alternative 4 would have short-term impacts on OHV users, as described in the Off-Highway Vehicle Use section, above. Logging activities may be more apparent to OHV users under this alternative than under Alternative 2, because it involves commercial thinning of young growth along existing road systems that are used by OHVs. These impacts would be short term. There would be no increase in the miles of roads/trails available for OHV use in the short term under this alternative, and full implementation of the proposed RMOs for proposed roads would result in a relatively small increase (2 miles) in the miles of motorized trail suitable for OHV use.

This alternative would have short-term impacts on outfitter/guide use, but is not expected to have long-term impacts on the ability of outfitter/guides to use currently permitted locations.

Recreation use patterns in the project area are not expected to change greatly as a result of this alternative because the popular recreation sites in the project area would not experience long-term effects and access to fishing and hunting activities is likely to remain relatively consistent. Potential impacts to wildlife populations and the availability of hunting and fishing species are addressed in the Issue 3: Wildlife and Subsistence Use and Fisheries sections of this document.

Cumulative Effects

Harvest and road building activities proposed under this alternative are located outside the existing IRA and, as noted above, would result in a reduction in SPNM, SPM, and RN acres in the project area (Table REC-5). Viewed in conjunction with other reasonably foreseeable projects, this alternative is not expected to contribute to long-term changes to overall patterns of recreation use in the project area. Existing opportunities would continue to be available for those seeking remote and primitive recreation experiences and those seeking access to fishing and hunting opportunities would continue to have those opportunities.

Short-term cumulative impacts could occur were one or more of the reasonably foreseeable projects to coincide in time and space with the project. This could result in additional temporary disruptions to recreation use and could affect the quality of the recreation experience in localized areas. These types of impacts would be limited to the duration of road building and harvest activities in a particular location.

Alternative 5

Direct and Indirect Effects

Under Alternative 5, a total of 753 acres would change from the SPNM ROS setting to RM (Table REC-5). This represents approximately 1 percent of the 69,231 acres currently allocated to SPNM in the project area. In addition, an estimated 233 acres would change from the SPM ROS setting to RM, and 20 acres would change from the RN ROS setting to RM; these respective changes represent approximately 2 percent of the total acres in the project area currently allocated to each of these ROS settings (Table REC-5).

This alternative would result in short-term impacts to recreation places and sites, as described in the Recreation Places and Sites section, above. This alternative would involve the second-largest number of total acres harvested, ranking second to Alternative 3 in terms of old-growth and young-growth acres. This alternative would require fewer miles of new road construction and road reconstruction than the other action alternatives because a larger portion of the units would be helicopter logged. Long-term impacts to recreation places and sites would primarily be related to changes in scenery. These impacts are discussed in the Scenery Resource Report (Evans 2013).

Logging activities may also be more apparent to recreation users under this alternative than under Alternative 2, because this alternative involves commercial thinning of young-growth units, which tend to be located closer to existing road systems than old-growth stands. Commercial thinning in young-growth areas is expected to have mostly short-term impacts on recreation and is not expected to have long-term impacts on scenery. In addition, the commercial thinning prescribed under this alternative may increase the deer forage in the area and provide more opportunities for hunting. Impacts to deer are discussed in the Issue 3: Wildlife and Subsistence Use section of this document. This alternative involves fewer commercial thinning acres than the other action alternatives (Alternatives 3 and 4) that include commercial thinning.

Alternative 5 would have short-term impacts on OHV users, as described in the Off-Highway Vehicle Use section, above. Logging activities may be more apparent to OHV users under this alternative than under Alternative 2, because it involves commercial thinning of young growth along existing road systems that are used by OHVs. These impacts would be short term. There would be no increase in the miles of roads/trails available for OHV use in the short term under this alternative, and full implementation of the proposed RMOs for proposed roads would result in a relatively small increase (1 mile) in the miles of motorized trail suitable for OHV use.

This alternative would have short-term impacts on outfitter/guide use, but is not expected to have long-term impacts on the ability of outfitter/guides to use currently permitted locations.

3 Environment and Effects

Recreation use patterns in the project area are not expected to change greatly as a result of this alternative, because the popular recreation sites in the project area would not experience long-term effects and access to fishing and hunting activities is likely to remain relatively consistent. Potential impacts to wildlife populations and the availability of hunting and fishing species are addressed in the Issue 3: Wildlife and Subsistence Use and Fisheries sections of this document.

Cumulative Effects

Harvest and road building activities proposed under this alternative are located outside the existing IRA and, as noted above, would result in a reduction in SPNM, SPM, and RN acres in the project area (Table REC-5). Viewed in conjunction with other reasonably foreseeable projects, this alternative is not expected to contribute to long-term changes to overall patterns of recreation use in the project area. Existing opportunities would continue to be available for those seeking remote and primitive recreation experiences and those seeking access to fishing and hunting opportunities would continue to have those opportunities.

Short-term cumulative impacts could occur were one or more of the reasonably foreseeable projects to coincide in time and space with the project. This could result in additional temporary disruptions to recreation use and could affect the quality of the recreation experience in localized areas. These types of impacts would be limited to the duration of road building and harvest activities in a particular location.

Scenery

Introduction

This section provides an assessment of the current condition of the project area and the potential effects of implementing the proposed action and the alternatives on scenery resources. Scenery resource direction for the project area is contained in the 2008 Forest Plan and described in the Scenery Forest-wide Standards and Guidelines (Chapter 4) for each specific management prescription or LUD (Chapter 3). The process of planning harvest units and how scenery resources were taken into account is documented in the Scenery Resource Report in the project record, as well as in the unit and road cards of Appendices B and C of the Draft EIS.

Methodology

The scenic resource objectives are based on the visibility of landscapes from identified Visual Priority Routes and Use Areas (VPRs) listed in Appendix F of the Forest Plan, incorporating management objectives of the Forest Plan land use designations. The scenic resource evaluation of the project area initially reviewed the GIS mapping data of inventoried visual resource attributes for content and accuracy. The adopted scenic integrity objectives (SIOs) for the project were formulated in GIS incorporating the Forest Plan land use designations and the distance zone visual resource attribute.

The analysis area for the scenery analysis is represented by the project area, because it contains the viewsheds used in the assessment.

Field reconnaissance surveys were conducted in 2011 by visiting VPRs and observing potential harvest areas. Project area landscapes were documented from key viewing points along VPRs using a digital single-lens reflex camera. Individual photographs were combined to create panoramic views of the proposed unit locations and the surrounding landscape. These photographs were used to evaluate the area visible from VPRs, existing scenery integrity, and the conditions needed to achieve the SIOs identified in the Forest Plan (Table SCEN-1).

Table SCEN-1. Scenic Integrity Objectives (SIOs) for the Primary LUDs in the Project Area as Identified in the Forest Plan

LUD	Foreground	Middleground	Background	Seldom Seen
Old-growth Habitat	High	High	High	High
Scenic River	High	Moderate	Moderate	Low
Recreational River	Moderate	Low/Moderate	Low/Moderate	Very Low
Scenic Viewshed	High	Moderate	Moderate	Very Low
Modified Landscape	Moderate	Low	Low	Very Low
Timber Production	Low	Very Low	Very Low	Very Low

Affected Environment

Landscape Character

Tongass National Forest is divided into 11 geographic areas defined as “landscape character types” that have general or distinguishing physical, biological, and cultural

3 Environment and Effects

characteristics which, help define the visual significance of a landscape (USDA Forest Service 2005b). Most of Prince of Wales Island and all of the project area falls into what is defined as the Prince of Wales Mountains/Lowlands landscape character type. This landscape character type consists of rounded, but often rugged mountains to 3,000 feet and higher, separated by hilly or rolling terrain and lowlands and dominated by forest vegetation. Hemlock and hemlock-spruce forests occur on well-drained sites, while mixed conifers and lodgepole pine forests occupy wetter areas. The forests are often moderately to highly productive on the steeper slopes and valley bottoms and nonproductive or with low productivity in the wetter lowlands. Open shrubby bogs and fens occur on the wettest spots and open alpine areas occur on mountain tops. Past timber harvest has produced many stands in various successional stages. Thorne Bay, Coffman Cove, Naukati, Klawock, and other settlements occur within or adjacent to the area, and roads, buildings, and other structures are very visible in or near these communities.

Scenic Attractiveness

Scenic attractiveness is the primary indicator of the intrinsic beauty of a particular landscape character type and of the positive responses it evokes in people. It helps determine landscapes that are important for scenic beauty, as well as those that are of lesser value, based on commonly held perceptions of the beauty of landform, vegetation pattern, composition, surface water characteristics, and land use patterns and cultural features (USDA Forest Service 2005b).

The scenery management system provides a process that rates the inherent scenic attractiveness based on the values listed above as either Class A – Distinctive, B – Typical or C – Indistinctive. The inventory for the project area identifies 11 percent of its landscape as Class A – Distinctive, 89 percent as Class B – Typical, and none as Class C – Indistinctive.

Visual Priority Routes and Use Areas (VPRs)

Appendix F of the Forest Plan identifies routes and use areas from which scenery is to be emphasized for each Ranger District. They include popular roads people drive, cabins or recreation areas that people use, and trails on which they hike or canoe. They also include cruise ship, ferry boat, and personal watercraft routes that are frequently travelled, or popular saltwater anchorages. VPRs specific to Thorne Bay Ranger District are identified on page F-18 in Appendix F of the Forest Plan.

There is a high concentration of VPRs in the project area (Figure SCEN-1). They include the following:

- § Main roads through the project area, including Klawock to Control Lake Junction, Control Lake Junction to El Capitan, Control Lake Junction to Thorne Bay, Thorne Bay to Sandy Beach, and Sandy Beach to Coffman Cove.
- § Dispersed recreation areas including Sandy Beach, Ratz Harbor, Salt Chuck, Control Lake, Snakey Lakes, Honker Lake, Honker Canoe Route, lower Thorne River, and Eagle Creek.

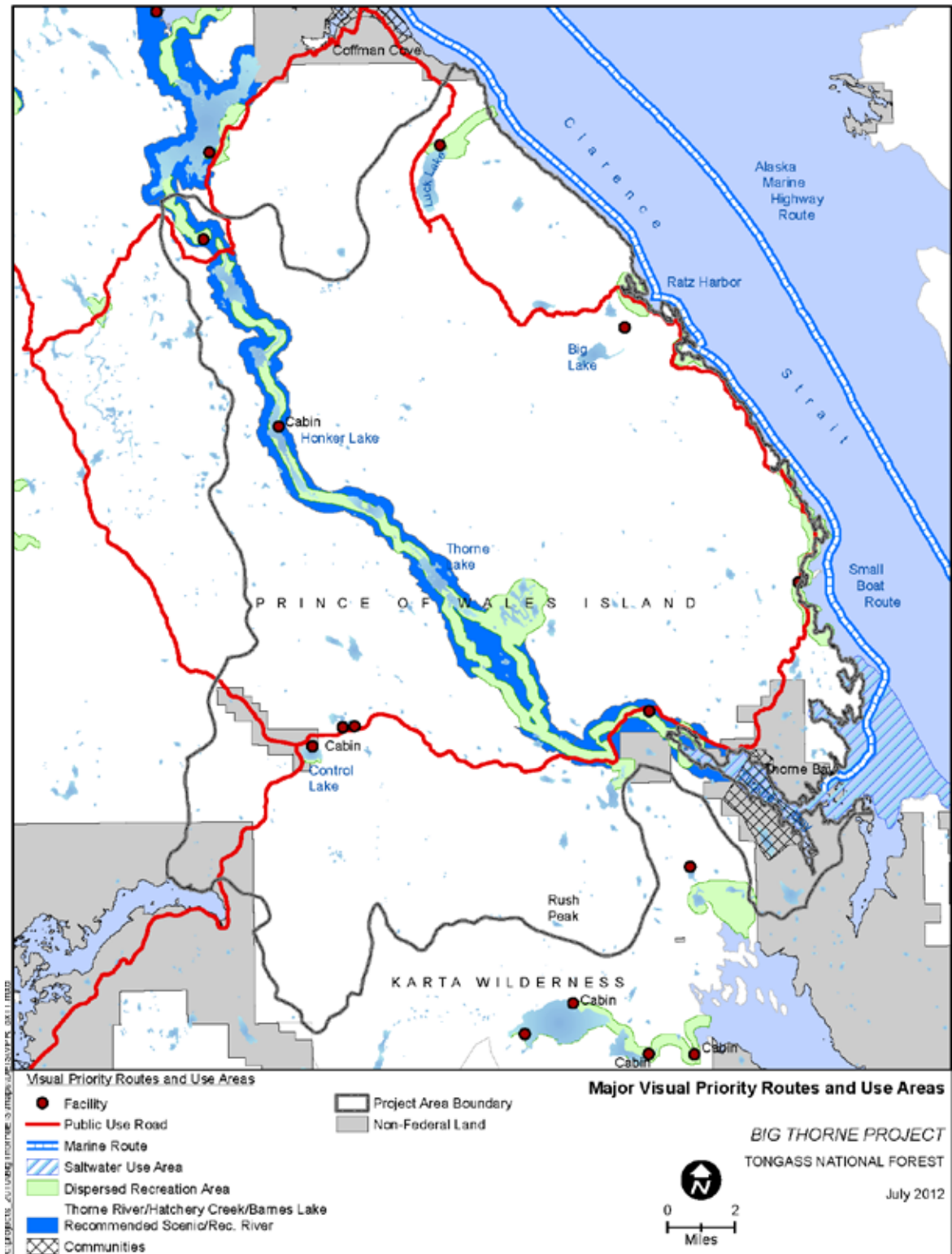


Figure SCEN-1. Major Visual Priority Routes and Use Areas in Big Thorne Project Area

3 Environment and Effects

- § Developed recreation areas including Eagles Nest Campground (Balls Lake), Balls Lake Picnic Area, Gravelly Creek Picnic Area, Sandy Beach Picnic Area, and Ratz Harbor Boat Launch.
- § Forest Service recreation cabins including the ones at Control Lake and Honker Lake.
- § Hiking trails including Eagles Nest Trail, Balls Lake Trail, Honker Divide Canoe Trail, and Gravelly Creek Trail.
- § Communities including Thorne Bay.
- § Recommended Wild and Scenic Rivers including the Thorne River/Hatchery Creek/Barnes Lake.
- § Alaska Marine Highway Routes and Small Boat and Mid-size Tour Boat Routes including Clarence Strait.
- § Saltwater Use Areas including Thorne Bay to Snug Anchorage.
- § Boat Anchorages including Big Ratz Harbor and Little Ratz Harbor.

Visibility and Distance Zones

The SIO for a given area is dependent on the LUD, as described above, together with its visibility (i.e., seen vs. not-seen areas) and distance zones (i.e., foreground, middleground, and background) from VPRs. Therefore, visibility and distance zones must be mapped and combined with LUD to determine SIO. They are mapped by measuring foreground, middleground, and background distances from the identified VPRs. The percentage of the project area mapped in the different distance zones are as follows: Foreground 9 percent, Middleground 24 percent, Background 2 percent, and Not Seen 65 percent.

Scenic Integrity Objectives (SIOs)

The Forest Service developed and implemented the Visual Management System in 1974. This long-serving system was replaced by the newer (but similar) Scenery Management System in 1995. Under this new system, SIO is the term used to describe the visual condition of the landscape.

The SIO is used to also describe the degree of acceptable alteration of the characteristic landscape, and is assigned to the combination of LUDs and distance zones, as seen from visual priority travel routes and use areas.

SIOs for the Tongass National Forest LUDs can be found on pages 4-56 to 4-59 of the Forest Plan (USDA Forest Service 2008a). The acreages of SIOs found in the project area are presented in Table SCEN-2.

Table SCEN-2. Acreage of Scenic Integrity Objectives (SIOs) in the Project Area

SIO	Project Area Acres
High	83,745
Moderate	8,036
Low	33,629
Very Low	92,269
Total NFS	217,679
Non-National Forest	14,169
Total All Lands	231,848

Figure SCEN-2 spatially displays the SIOs adopted by the Forest Plan for the project area. The SIOs adopted by the Forest Plan are defined as follows:

- § Very High SIO: Landscapes where the landscape character is intact with only minute, if any, deviations.
- § High SIO: Landscapes where the landscape character “appears” intact. Deviations are not readily evident to the casual observer.
- § Moderate SIO: Landscapes where the landscape character “appears slightly altered.” Deviations are noticeable to the casual observer, but do not dominate landscape.
- § Low SIO: Landscapes where the landscape character “appears moderately altered.” Deviations can begin to dominate a scene, but must blend with surrounding landscape, as viewed by the casual observer.
- § Very Low SIO: Landscapes where the landscape character “appears heavily altered.” Deviations clearly dominate, but must blend to some degree.

Existing Scenic Integrity (ESI)

The Forest Plan (p. 4-56) states that it is important to compare the existing scenic integrity of the project area to the SIO of the land use designation. This is to determine if existing condition conflicts with Forest Plan SIOs and how much additional disturbance is allowed.

Existing scenic integrity (ESI) is defined as the current state of the landscape, considering previous human alterations (USDA Forest Service 1995, p. I-2). The latest spatial data on record that represents ESI is the existing visual conditions layer (EVC) (Table SCEN-3).

Table SCEN-3. Existing Visual Condition/Existing Scenic Integrity in the Project Area

EVC/ESI Type	Project Area Acres
Type 1 - Natural	86,330
Type 2 - Naturally Appearing	128
Type 3 - Slightly Altered	14,016
Type 4 - Altered	49,660
Type 5 - Heavily Altered	67,545
Total NFS	217,679
Non-National Forest	14,169
Total All Lands	231,848

3 Environment and Effects

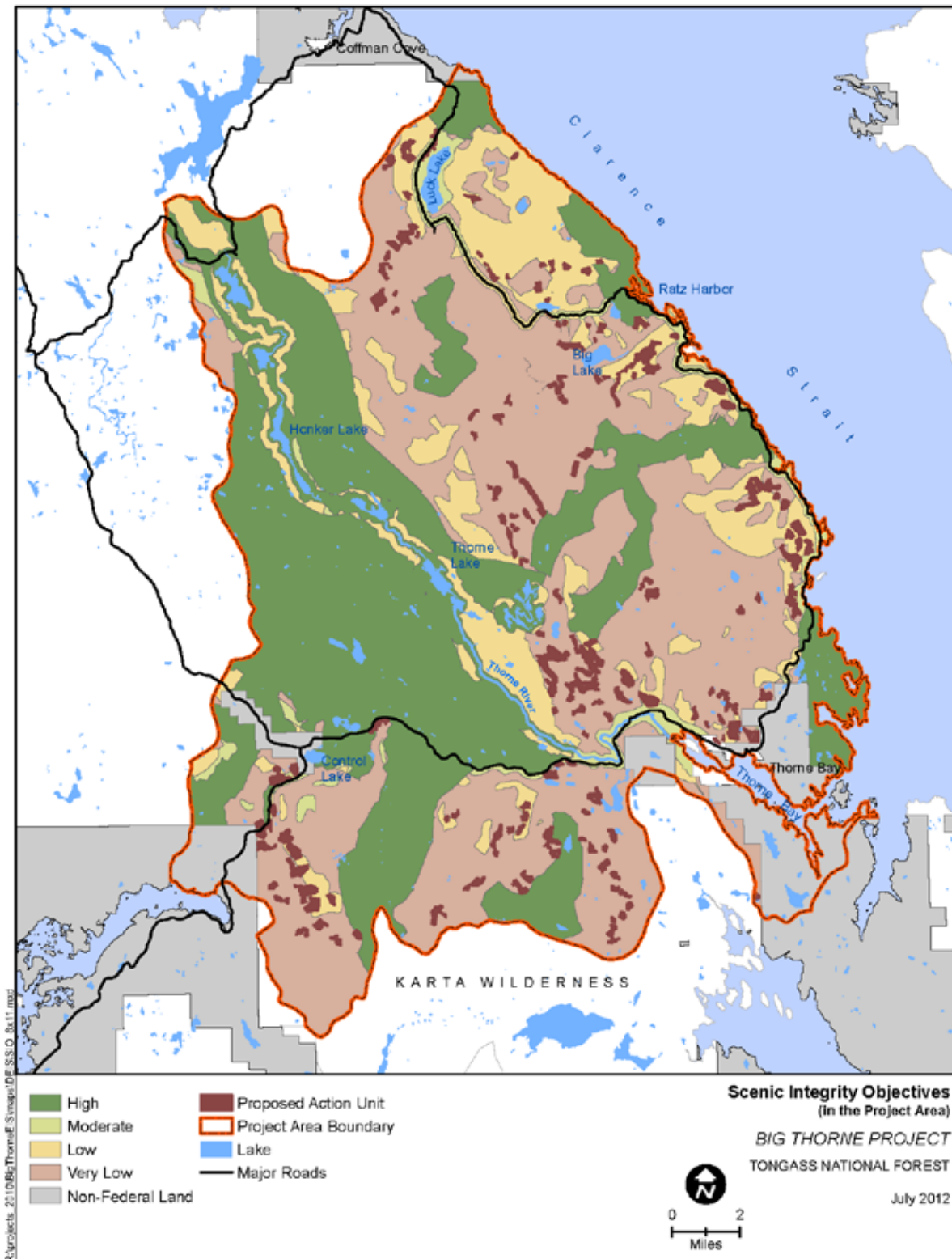


Figure SCEN-2. Scenic Integrity Objectives in the Big Thorne Project Area

Visual Absorption Capability

Visual absorption capability (VAC) is defined as an index of the relative ability of a landscape to accept alteration (e.g., timber harvesting) without significantly affecting its visual character, and is classified as being High, Intermediate, or Low. For example, High VAC means that landscape has the greatest ability to absorb change, where Low VAC means a low ability to absorb change generally due to steep slope conditions.

Timber harvest unit sizes can be influenced by the VAC settings in combination with SIOs (see Forest-wide Standards and Guidelines for Scenery), and referring to these factors in the unit layout and design portion of the planning process is recommended.

Environmental Consequences

Direct, indirect and cumulative effects for scenery in all affected viewsheds are estimated using quantifiable measures or indicators for actual effects, as supported by the references (for example, percent of visible areas are an indicator for increased visibility under each alternative). The level (magnitude and intensity) of effects is also characterized by measures/indicators which account for how measurable the effect would be, how widespread the effect is likely to be, and how long it is likely to last.

Direct and Indirect Effects***Effects Common to the Action Alternatives***

The effects of the Big Thorne Project would be limited through the site-specific application of Forest Plan standards and guidelines in all alternatives. In particular, the LUD-specific measures identified in Chapter 3 and the Forest-wide measures identified in the Scenery section of Chapter 4 would be implemented.

For the Big Thorne Project, mitigation to reduce scenery effects was incorporated into harvest unit design and harvest unit prescriptions for all alternatives. Units with moderate or high SIOs were given priority for mitigation. Primary measures included: 1) deferring harvest of a setting or group of settings; 2) modifying unit size and/or shape; 3) changing prescription to partial harvest with 25 to 50 percent removal; 4) use of vegetative screening or buffers adjacent to VPRs; and 5) when needed, have the Forest landscape architect involved in final unit design. Where new roads are proposed or existing roads are reconstructed, the expansion of existing rock quarries would be required; final design of this expansion would be reviewed by the Forest landscape architect, if there are scenery concerns.

In general, the effects of the alternatives on scenery would be derived from the harvest of old growth, thinning of young growth, and road construction and reconstruction. Among these actions, the harvest of old growth and new road construction would have the greatest effect. Thinning of young growth would have very minimal effects on scenery because from half to two-thirds of the original stand would remain, including the tallest trees. This definitely applies to uniform thinning, which was the preferred method. However, strip thinning is used where necessary because of logging system requirements, and it has the potential to create visual issues. The resolution is that where strips could be a visual concern, the strip width was adjusted to be 20 feet wide. A width slightly less than the expected spacing between leave trees in the other thinning prescriptions, thus their

3 Environment and Effects

visibility would be minimized. For these reasons, the discussions that follow emphasize the effects of old-growth harvest and road construction.

All alternatives would meet the level of scenic quality prescribed by the SIOs adopted for the affected landscapes in the Forest Plan. The overall effects from management activities within the project area would be visually evident to varying degrees dependent upon distance at which observed, type and extent of harvest, and weather conditions at the time observed. Visual disturbance would be dispersed throughout the project area with no single area impacted beyond maximum disturbance thresholds at any one time.

A general measure of the direct effects of the alternatives is the acreage of harvest units and miles of road by SIO. Because Old-growth Habitat LUDs would change under Alternatives 3 and 4, there would be changes in the SIOs that need to be achieved in specific areas (see Issue 2 scenery discussions, earlier in this chapter). The new SIO allocations under Alternatives 3 and 4 are mapped in Figures SCEN-3 and SCEN-4. These can be compared with the existing SIOs in Figure SCEN-2.

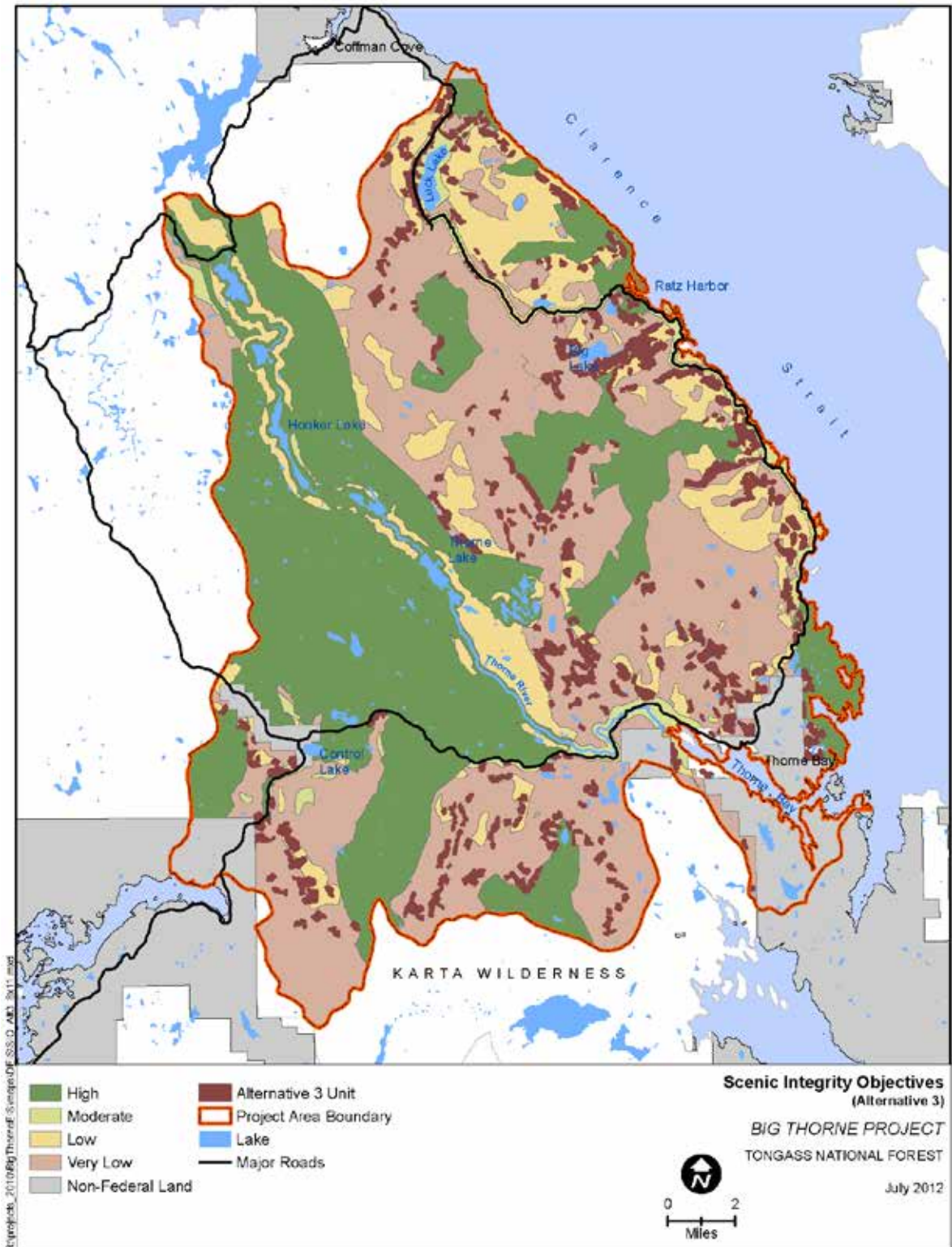


Figure SCEN-3. Scenic Integrity Objectives with Alternative 3 in the Big Thorne Project Area

3 Environment and Effects

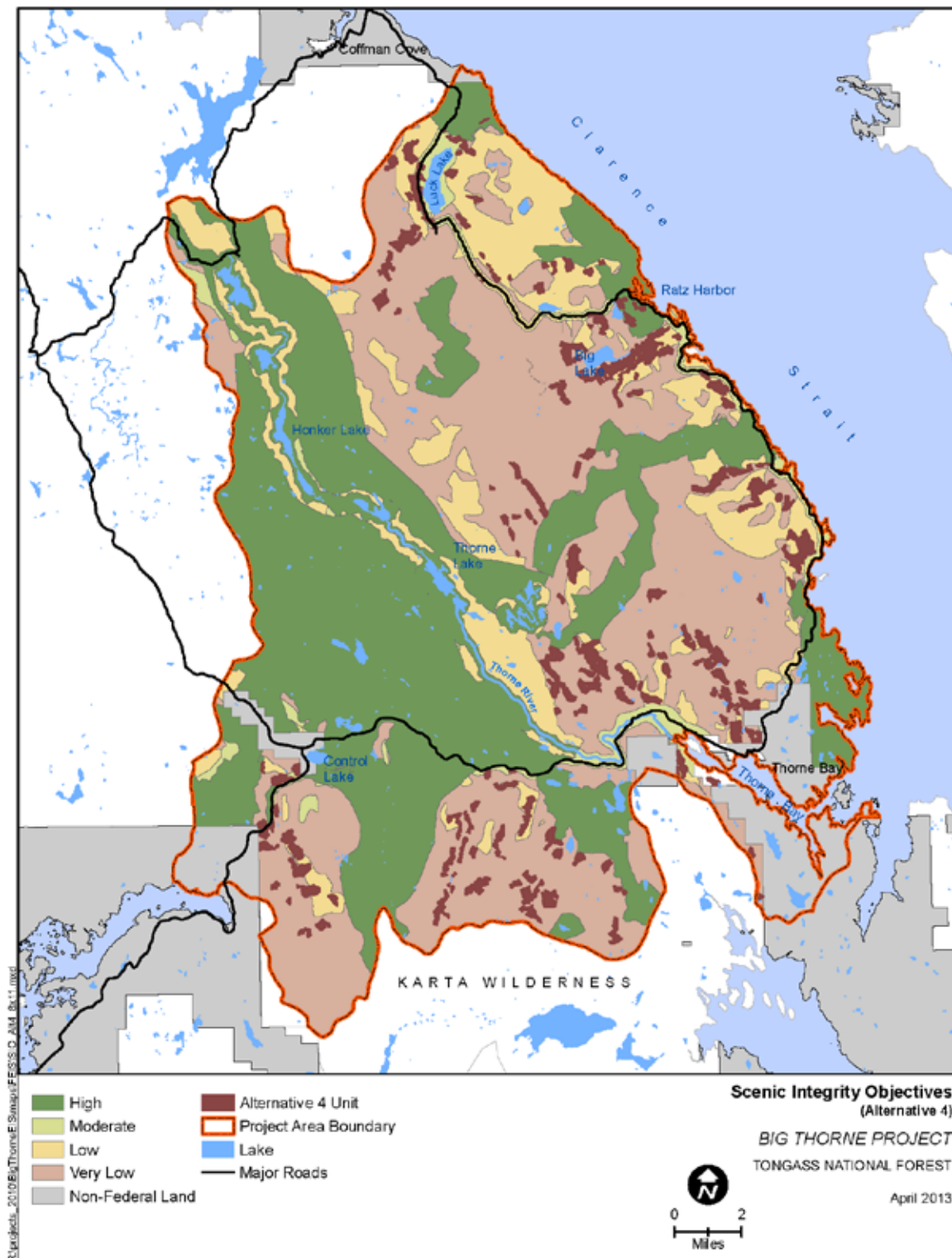


Figure SCEN-4. Scenic Integrity Objectives with Alternative 4 in the Big Thorne Project Area

Table SCEN-4 presents these acreages and categorizes them by method of harvest. This information is referred to in the following alternative-specific discussions. In general, Alternative 3 includes the highest acreage of harvest in both High and Moderate SIO, while Alternative 4 includes the lowest acreage. Alternatives 2 and 5 would be intermediate.

Table SCEN-4. Clearcut (CC) and Partial Cut (PC) Harvest Acreage for Old Growth by Scenery Integrity Objective under the Action Alternatives

SIO	Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
	CC	PC	CC	PC	CC	PC	CC	PC	CC	PC
High	0	0	59	15	59	16	19	18	54	16
Moderate	0	0	162	54	318	125	17	1,317	110	125
Low	0	0	981	575	1,292	1,134	341	58	601	1,310
Very Low	0	0	2,714	561	3,268	907	603	2,382	1,688	1,547
TOTAL	0	0	3,915	1,205	4,937	2,182	982	3,775	2,453	2,999

Similarly, Table SCEN-5 presents the road miles to be constructed and reconstructed by SIO for each alternative. Again in general, Alternative 3 includes the highest road construction and reconstruction mileage in High and Moderate SIOs; however, Alternative 5 would include the lowest mileages. Alternatives 2 and 4 would be intermediate.

Table SCEN-5. Road Construction (Con) and Reconstruction (Rec) Mileage by Scenery Integrity Objective under the Action Alternatives

SIO	Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
	Con	Rec	Con	Rec	Con	Rec	Con	Rec	Con	Rec
High	0	0	0.6	0.7	0.8	1.3	0.4	0.2	0.7	0.5
Moderate	0	0	1.3	0.2	4.0	0.6	1.2	0.4	2.2	0.3
Low	0	0	8.2	2.9	14.3	6.1	3.7	2.4	4.6	3.9
Very Low	0	0	21.9	14.0	31.3	28.0	5.9	16.1	8.8	12.5
Non-NFS	0	0	0.1	0.3	1.0	0.8	0.4	0.3	0.4	0.3
TOTAL	0	0	32.1	18.1	51.4	36.7	11.5	19.3	16.6	17.5

A description of each alternative, with specific information regarding units of special visual concern, is provided in the following subsections.

Alternative 1

Under the No-action Alternative, no timber harvest or thinning and no road construction or reconstruction would occur under the Big Thorne Project. Therefore, no direct or indirect effects on scenery would occur, except for those associated with small roadside sales, thinning, and road maintenance and storage activities, which would result in insignificant changes. This alternative defers timber harvest in the project area and maintains the existing visual character of the landscape. Previously harvested units within the project area would continue to mature and develop the visual characteristics of a more natural appearing and undeveloped forest.

3 Environment and Effects

Alternative 2

Alternative 2 would meet the SIOs adopted by the Forest Plan. Timber harvest and road construction would occur as described in Tables SCEN-4 and SCEN-5. Clearcut harvest would occur on 59 acres of High SIO and 162 acres of Moderate SIO (Table SCEN-4). In addition, 0.6 mile of road would be constructed in High SIO and 1.3 miles would be constructed in Moderate SIO; an additional 0.9 mile of existing road would be reconstructed in High and Moderate SIO (Table SCEN-5). No commercial harvest of young growth would occur in this alternative. Specific harvest unit mitigation measures for visually sensitive units that are designed to meet the adopted SIO are described in the following paragraphs.

Units 5950-1, 5950-2, and 5950-22, along the highway from Klawock to Control Lake Junction, are partially or entirely (595-22) within Scenic Viewshed LUD and portions of them are included in High SIO. All units were modified to include a visual buffer along the highway to partially screen views into the units from the VPR.

Unit 5950-24 is also along the highway from Klawock to Control Lake Junction and is partially within Scenic Viewshed LUD with the remainder in Modified Landscape. As a result, most of the unit is either Moderate or High SIO. The unit is set back 200 to 500 feet from the highway, but is on a slope that rises 300 or so feet above the highway and is visible from highway straight stretches. Therefore, this unit was prescribed for uneven-aged management with 50 percent basal area retention.

Unit 5960-27 is along the highway from Control Lake Junction to Thorne Bay and is entirely within the Scenic Viewshed LUD. As a result, most of the unit has an adopted SIO of High and the unit was modified to include a visual buffer along the highway, which in conjunction with a riparian buffer, would partially screen views into the unit from the VPR.

Alternative 2 includes Units 5972-115, 5972-116, and 5972-117, which also occur along the Control Lake Junction to Thorne Bay Highway. These units include portions in Moderate SIO as well as Low SIO. Partial screening from the highway is provided by visual buffers that follow the highway, complementing existing riparian buffers.

About 11 acres of Unit 5971-62 and about 27 acres of Unit 5790-119 are inside the outer edge of the Recreational River LUD and have Moderate SIOs. Neither of these units is visible from anywhere near the river and both would meet SIOs. No other units in this alternative are expected to be visible from the Scenic or Recreational River corridor and no effect on the outstandingly remarkable scenery value is expected.

Unit 5790-119 is near the highway from Control Lake Junction to Thorne Bay and is also close to the Thorne River and the Gravelly Creek Picnic Area. This unit is screened by a wide (400- to 700-foot) buffer along the highway, which is established for other resource reasons and identified as legacy.

Units 5850-138 and 5850-139 are located about ¼ mile inland from Sandy Beach. These units are clearcut. Legacy was added in many areas to partially screen the harvest. The units contain areas with Moderate, Low, and Very Low SIOs.

Units 585-140, 585-141, 585-142, and 584-143 are located about a mile north of the previous two units and are also close to the Sandy Beach to Coffman Cove Road and are generally over 1,500 feet from saltwater. These units were modified by changing some prescriptions to uneven-aged management and adding substantial legacy areas between the units and the road and saltwater. The remaining harvest areas are mostly Low with some Very Low and Moderate SIOs. Overall, the visibility of some harvest areas would be a distraction from the natural scenic environment but confined to relatively small areas.

Units 584-153 and 584-154 are located further north along the Sandy Beach to Coffman Cove Road, south of Ratz Harbor. They are about 1,200 feet from saltwater. Unit 584-153 would be clearcut, but is 72 percent in Low and Very Low SIO with 13 acres in Moderate SIO. Unit 584-154 would be partial cut (uneven-aged management).

Units 584-149, 584-161, 584-171, and 583-174 are units on slopes along Clarence Strait that are varying distances from saltwater. These are all prescribed for uneven-aged management.

Units 581-191, 581-192, and 581-193 are along the Sandy Beach to Coffman Cove Road adjacent to Luck Lake. They are small clearcut units ranging from 8 to 21 acres in size and would be visible to some degree from the road. Unit 581-191 contains screening along the road. All of the units are partially screened by riparian buffers and legacy from Luck Lake.

Units 581-194, 581-195, 581-197, and 581-200 are located on the mid- to upper-slopes to the west of Luck Lake. These units contain clearcut and partial cut (uneven-aged management) settings and include a large portion of helicopter harvest. The adopted SIO for these units consists entirely of Low and Very Low.

Alternative 3

Alternative 3 would meet the SIOs adopted by the Forest Plan. Timber harvest and road construction would occur as described in Tables SCEN-4 and SCEN-5. Clearcut harvest would occur on 59 acres of High SIO and 318 acres of Moderate SIO (Table SCEN-4). In addition, 0.8 mile of road would be constructed in High SIO and 4.0 miles would be constructed in Moderate SIO; an additional 1.8 mile of existing road would be reconstructed in High and Moderate SIO (Table SCEN-5). Thinning of young growth would occur in this alternative. Specific harvest unit mitigation measures for visually sensitive units that are designed to meet the adopted SIO are described in the following paragraphs.

Units 595-1, 595-2, 595-22, 595-24, 596-27, 5972-115, 5972-116, 5972-117, and 579-119, along the highways from Klawock to Control Lake Junction and from Control Lake Junction to Thorne Bay, would be treated the same as described under Alternative 2.

Portions of Units 575-380, 575-381, 575-382, 575-383, 575-384, 575-386, 575-387, and 575-394 may be visible in the middleground at distances of a mile or more from the Honker Divide Canoe Route from a few locations on lakes near the middle of the route. They have Low and Very Low SIOs. Large portions of the more visible upper slopes were converted to uneven-aged management to reduce their visibility. Although these units could slightly reduce visual quality from a few locations along this portion of the route, for the vast majority of the Canoe Route and the Scenic River corridor (even in this

3 Environment and Effects

portion of the route), they would not be visible. The slight change in distance views is not expected to affect the overall classification of the Scenic River as having outstandingly remarkable scenery values.

The visibility of Units 597.1-62 and 579-119, partially in the Recreational River LUD, would be the same as described under Alternative 2.

Units 585-138, 585-139, 585-140, 585-141, 585-142, and 584-143, located near and to the north of Sandy Beach, would be treated the same as described under Alternative 2. Similarly, Units 584-153 and 584-154, located further north along the Sandy Beach to Coffman Cove Road, south of Ratz Harbor, would also be treated the same as for Alternative 2.

Units 584-149, 584-161, 584-171, and 583-174, located on slopes along Clarence Strait at varying distances from saltwater, would be treated the same as described under Alternative 2.

Units 584-452, 584-454, 584-455, 584-456, and 584-457 are also located on slopes along Clarence Strait, generally 1,000 to 4,000 feet from saltwater. They include some acreage with Moderate SIO, but they are mostly in Low SIO. The two largest units with the majority of the Moderate SIO area would be mostly or entirely partial cut (uneven-aged management), while the smaller units would be clearcut.

Units 582-207, 582-212, 582-213, and 582-463 are located on slopes close to Clarence Strait between Ratz Harbor and Eagle Creek. All of these units are generally about 1,000 feet from saltwater, but are allocated to Low SIO. However, all of the units, except for 582-207, which is only 15 acres, would be partial cut (uneven-aged management).

Units 581-191, 581-192, and 581-193, along the Sandy Beach to Coffman Cove Road adjacent to Luck Lake, and Units 581-194, 581-195, 581-197, and 581-200, located on the mid- to upper-slopes to the west of Luck Lake, would be treated as for Alternative 2.

Units 581-464, 581-465, and 581-466 are located along Eagle Creek, between Luck Lake and Clarence Strait. These units consist primarily of Moderate and Low SIO. They are generally screened along the creek by its riparian buffer, some legacy patches on the stream-side of the units, the relatively flat topography, and the fact that about 88 percent of the harvest areas are uneven-aged management.

Units 581-469, 581-470, and 581-471 are located along the Sandy Beach to Coffman Cove Road north of Luck Lake. These clearcut units are almost entirely in Moderate and Low SIO. They are screened along the road with visual buffers, which are incorporated into the units as legacy.

Alternative 4

Alternative 4 would meet the SIOs adopted by the Forest Plan. Timber harvest and road construction would occur as described in Tables SCEN-4 and SCEN-5. Clearcut harvest would occur on 19 acres of High SIO and 18 acres of Moderate SIO (Table SCEN-4). These acreages are by far the lowest among the action alternatives. In addition, 0.4 mile of road would be constructed in High SIO and 1.2 miles would be constructed in Moderate SIO; an additional 0.6 mile of existing road would be reconstructed in High and Moderate SIO (Table SCEN-5). Thinning of young growth would occur in this

alternative. Specific harvest unit mitigation measures for visually sensitive units that are designed to meet the adopted SIO are described in the following paragraphs.

Units 595-1, 595-2, 595-22, and 579-119, along the highways from Klawock to Control Lake Junction and from Control Lake Junction to Thorne Bay, would be treated the same as described under Alternative 2. Similarly, the visibility of Units 597.1-62 and 579-119, partially in the Recreational River LUD, would be the same as described under Alternative 2.

Units 585-139, 585-140, 585-142, and 584-143, located near Sandy Beach and to the north of it, are almost entirely partial cut. Note that Units 585-138 and 585-141, which are described under Alternative 2 with this group, were dropped from Alternative 4. Similarly, Unit 584-154, located further north along the Sandy Beach to Coffman Cove Road, south of Ratz Harbor, would also be treated with partial cutting as for Alternative 2. Again, note that Unit 584-153 is not included in Alternative 4.

Units 584-149, 584-171, and 583-174, located on slopes along Clarence Strait varying distances from saltwater, would be treated the same as described for Alternative 2. Unit 584-161, which is described in this group, is not included in Alternative 4.

Units 581-194, 581-195, 581-197, and 581-200, located on the mid- to upper-slopes to the west of Luck Lake, would be treated as described for Alternative 2, except that 581-195 would be partial cut.

Alternative 5

Alternative 5 would meet the SIOs adopted by the Forest Plan. Timber harvest and road construction would occur as described in Tables SCEN-4 and SCEN-4. Clearcut harvest would occur on 54 acres of High SIO and 110 acres of Moderate SIO (Table SCEN-4). In addition, 0.7 mile of road would be constructed in High SIO and 2.0 miles would be constructed in Moderate SIO; an additional 0.8 mile of existing road would be reconstructed in High and Moderate SIO (Table SCEN-5). Thinning of young growth would occur in this alternative. Specific harvest unit mitigation measures for visually sensitive units that are designed to meet the adopted SIO are described in the following paragraphs.

Units 595-1, 595-2, 595-22, 595-24, 596-27, and 579-119, along the highways from Klawock to Control Lake Junction and from Control Lake Junction to Thorne Bay, would be treated the same as described under Alternative 2. Similarly, the visibility of Units 597.1-62 and 579-119, partially in the Recreational River LUD, would be the same as described under Alternative 2. In addition, Alternative 5 includes Units 5972-115, 5972-116, and 5972-117, which are along the highway from Control Lake Junction to Thorne Bay. These units would be treated as described under Alternative 3.

Units 585-138, 585-139, 585-140, and 585-14, 585-142, and 584-143, located near Sandy Beach and to the north of it, would all be entirely partial cut with 50 to 75 percent retention, so there would be no visual concerns.

Units 584-149, 584-161, 584-171, and 583-174, located on slopes along Clarence Strait varying distances from saltwater, would be treated the same as described for Alternative 2.

3 Environment and Effects

Units 582-212 and 582-213, located on slopes close to Clarence Strait between Ratz Harbor and Eagle Creek, would be treated the same as described for Alternative 3. Note that Units 582-207 and 582-463, which are part of this group, are not included in Alternative 5.

Units 581-191, 581-192, and 581-193, along the Sandy Beach to Coffman Cove Road adjacent to Luck Lake, and Units 581-194, 581-195, 581-197, and 581-200, located on the mid- to upper-slopes to the west of Luck Lake, would be treated as for Alternative 2, except they would have more extensive partial harvesting.

Cumulative Effects

Cumulative effects consider the overall scenic effects expected as a result of past, present, and reasonably foreseeable future development. These effects include timber harvest, roads, rock pits, associated construction activities, and existing effects of adjacent non-National Forest System lands. Previous development in the project area has modified the scenic environment of many areas from a natural condition to a condition where some landscapes appear heavily altered. These effects of past timber harvest would continue to lessen over time, becoming more natural appearing during the reasonably foreseeable future.

The scale or spatial extent from which to consider cumulative effects for the scenery resource can be represented as a viewshed, or for the purpose of this analysis, the VCUs, which have similar boundaries. Reasonably foreseeable activities such as thinning and road maintenance would not add additional scenic effects to the point of changing the overall scenic integrity, as cumulative effects change over time (temporal extent) as young-growth stands mature. After a period of 30 years, young-growth stands are considered to have visually recovered.

Percent Allowable Visual Disturbance represents an index of cumulative effects modeled as the expected visual consequences of timber harvest during the analysis, and is described in Appendix B of the Forest Plan Final EIS, page B-23. Visual disturbance outcomes vary by the scenic objectives for each of the LUDs available for timber harvest. Using this model, it was assumed for viewsheds within the Timber Production LUD that up to 50 percent of a viewshed may be under development at one time. For viewsheds within the Modified Landscape LUD, up to 25 percent may be under development at one time. This is calculated by adding the past, present, and reasonably foreseeable harvest acres and dividing by the acres of a viewshed or VCU. Table SCEN-6 represents a comparison of the expected cumulative visual disturbance by alternative. As noted above, all harvest areas 30 years old or younger were included as past disturbance. Because uneven-aged or two-aged management and commercial thinning do not add appreciably to cumulative effects on a viewshed or landscape scale, only even-aged management is included.

Table SCEN-6 Cumulative Visual Disturbance in terms of Cumulative VCU Harvest (<30 yr-old young growth) and Percent of VCU Area Harvested for All Lands (includes past harvest, future Big Thorne clearcut harvest, other future NFS harvest, and future State harvest)^{1/}

VCU	Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
	Cum. Acres ^{3/}	Cum. %	Cum. Acres ^{3/}	Cum. %	Cum. Acres ^{3/}	Cum. %	Cum. Acres ^{3/}	Cum. %	Cum. Acres ^{3/}	Cum. %
5740	1,706	6	1,706	6	1,706	6	1,706	6	1,706	6
5750	403	2	403	2	558	3	403	2	403	2
5760	546	4	559	4	559	4	546	4	559	4
5780	1,016	16	1,575	24	1,575	24	1,031	16	1,343	21
5790	1,170	11	1,517	14	1,593	15	1,258	12	1,430	13
5800	928	6	1,039	7	1,132	7	939	6	947	6
5810	2,064	10	2,396	12	2,548	13	2,114	10	2,264	11
5820	0	0	15	0	15	0	61	1	0	0
5830	1,172	9	1,477	12	1,485	12	1,190	10	1,389	11
5840	1,206	9	1,442	10	1,507	11	1,223	9	1,334	10
5850	735	7	992	9	1,081	10	948	9	754	7
5860 ^{2/}	2,324	14	2,631	16	2,869	18	2,654	16	2,650	16
5950 ^{2/}	4,579	21	5,210	24	5,310	25	4,610	22	5,015	23
5960 ^{2/}	279	2	343	3	343	3	426	3	339	3
5971	213	7	239	7	239	7	213	7	239	7
5972 ^{2/}	2,668	12	3,383	16	3,428	16	2,668	12	3,092	14
ALL VCUs	21,009	9	24,925	11	25,947	11	21,991	10	23,462	10

1/ Includes past harvest between 1981 and 2010; excludes past harvest greater than 30 years old as visually recovered. For the action alternatives, includes all proposed old-growth even-aged management acres; does not include commercial thinning of young growth or uneven-aged management.

2/ These VCUs include past harvest on state and private lands.

3/ 1,047 acres of future non-Big Thorne harvest is included on state and NFS lands.

3 Environment and Effects

As shown in Table SCEN-6, all VCUs in all alternatives are below the total allowable visual disturbance thresholds of 50 percent for Timber Production areas and all are equal to or below the 25 percent for Modified Landscape areas. Only two VCUs (5780 and 5950) have values above 18 percent for any of the alternatives. VCU 5780 (North Thorne River) has a cumulative percent of 24 percent in Alternatives 2 and 3, and 21 percent in Alternative 5. VCU 5950 (Steelhead Creek) has a cumulative percent of 21 percent in Alternative 1, 22 percent in Alternative 4, 23 percent in Alternative 5, 24 percent in Alternatives 2, and 25 percent in Alternative 3. The high values for VCU 5950 are partially caused by a high percentage of harvest on private lands in the western portion of the VCU, which is not connected to most of the viewsheds in the VCU.

The visual effects of timber harvest are greatest immediately following completion of the project. Within 5 years, vegetation would begin to grow, transitioning in color from brown to light green. Green tree retention in the harvested areas (especially in uneven-aged management areas, but also due to legacy, visual buffers, riparian buffers, and other leave areas) would reduce the overall contrast of new growth with the surrounding forest. From 5 to 20 years after tree removal, young trees become established reaching a height of approximately 15 to 30 feet and further reducing the color contrast with adjacent forested areas. After 50 years, the emerging forest would achieve a height of approximately 50 to 100 feet. Although still a lighter green in color than mature or old-growth forest, the color contrast at this point is less and textural differences are more apparent because the young-growth stands appears much more uniform. Edge lines forming the boundary of harvested areas also become less apparent, with the appearance further reduced by asymmetrical design. At 80 years after a harvest, stand vegetation achieves 75 percent of its mature height. At 100 years, the stand would reach approximately 100 feet in height and appearance of the past harvest would not be evident.

Assuming implementation of the Forest Plan, harvest of all suitable timber lands within the Big Thorne project area would occur within the next 100 to 120 years. During this period, the project area would be transitioning towards meeting the desired condition for the development LUDs. The landscape would be characterized by a mixture of stands ranging in stages of development. Age-classes of these stands would include recently harvested or regenerating stands, stands of young-growth composed of pole sized trees, to more mature young-growth and old-growth stands. The appearance of the activities associated with timber harvest within the Timber Production LUD will present a landscape highly modified by this change. To a lesser degree, landscapes within the Modified Landscape LUD and Scenic Viewshed LUDs will appear less modified by change. Landscapes within the Old-Growth Habitat and Semi-remote Recreation LUDs would remain unchanged.

Inventoried Roadless Areas and Wilderness

Introduction

Inventoried roadless areas (IRAs) are defined as undeveloped areas typically exceeding 5,000 acres that meet the minimum criteria for wilderness consideration under the Wilderness Act and were inventoried during the Forest Service's Roadless Area Review and Evaluation (RARE II) process and during subsequent updates and forest planning analyses. The Tongass is currently using the IRA boundaries associated with the 2001 Roadless Rule (USDA Forest Service 2001b), which are identified in a set of maps, associated with the Forest Service Roadless Area Conservation, Final EIS, Volume 2, dated November 2000. These maps identify 9.3 million acres in IRAs on the Tongass and correspond closely with the 1996 roadless area inventory that was prepared for the 1997 Forest Plan Revision (USDA Forest Service 1997b). Including Wilderness, the Tongass National Forest is currently more than 90 percent roadless.

There is no designated Wilderness located within the Big Thorne project area. The Karta River Wilderness forms the southern boundary of the project area.

Analysis Methods

This project-level analysis does not evaluate roadless areas for wilderness recommendation. It does, however, summarize the roadless characteristics associated with the IRAs in the project area. Detailed descriptions of the IRAs on the Tongass are included in Appendix C to the Tongass Land Management Plan Revision, Final Supplemental EIS (SEIS), Roadless Area Evaluation for Wilderness Recommendations (USDA Forest Service 2003a). These characteristics are also discussed in more detail in the individual resource sections in this EIS. Table IRA-1 summarizes the roadless characteristics considered and the section in this chapter where potential effects are discussed.

Table IRA-1. Roadless Characteristics and Discussion Sections

2001 Roadless Rule Characteristics	Chapter 3 Section
Biological Values	
Diversity of plant and animal communities	Issue 3: Wildlife and Subsistence Use, Botany, Fisheries
Habitat for threatened, endangered, proposed, candidate, and sensitive species, and for those species dependent on large, undisturbed areas of land	Issue 3: Wildlife and Subsistence Use, Botany, Fisheries
Physical Values	
High quality or undisturbed soil, water, and air	Issue 4: Cumulative Watershed Effects, Soils
Sources of public drinking water	Aquatics
Social Values	
Primitive, Semi-Primitive Non-Motorized, and Semi-Primitive Motorized classes of dispersed recreation opportunities	Recreation
Reference landscapes	Scenery
Natural appearing landscapes with high scenic quality	Scenery
Traditional cultural properties and sacred sites	Heritage Resources
Other locally identified unique characteristics	Recreation and Heritage Resources

Source: USDA Forest Service 2000

3 Environment and Effects

None of the alternatives propose old-growth harvest units, young-growth thinning units, new roads, or reconstructed roads within IRAs and there would be no direct impacts to IRAs under any of the alternatives. The 2001 Roadless Rule does not prohibit development outside of IRAs; however, development close to an IRA could indirectly affect roadless area characteristics. The following analysis assessed these potential indirect effects by assessing the “zones of influence” that would be associated with activities outside but close to an IRA. The zones of influence considered in this analysis are a 600-foot buffer around old-growth harvest units and a 1,200-foot buffer placed around roads (USDA Forest Service 2003c).

The analysis focuses on potential impacts to the unique or outstanding biological, physical or social values of the IRAs. Roadless characteristics (i.e., values or features that make the area meet the minimum criteria for wilderness consideration under the Wilderness Act) are described in the Roadless Area Conservation Final EIS (USDA Forest Service 2000, Vol. 1, pp. 3-3 to 3-7).

Affected Environment

There are three IRAs partially located within the 232,000-acre Big Thorne project area: 509 – Kogish, 510 – Karta, and 511 – Thorne River. One IRA, 512 – Ratz, is entirely located in the project area. These areas are shown in Figure IRA-1. Summary data are presented in Table IRA-2. Approximately 47 percent of the area within these IRAs (92,232 acres) is located within the Big Thorne project area, ranging from just 5 percent (2,974 acres) of the Kogish IRA to all of the Ratz IRA (Table IRA-2).

IRAs comprise approximately 40 percent (92,232 acres) of the Big Thorne project area, including 29 percent of the project area’s Development LUDs and 60 percent of the Non-Development LUDs.

Table IRA-2. Inventoried Roadless Areas Located within the Big Thorne Project Area (partially or wholly)

Roadless Area Number	Name	Total Acres	Acres in the Project Area	Percent of IRA in the Project Area ^{1/}	IRA as a Percent of the Project Area ^{2/}
509	Kogish	64,466	2,974	5%	1%
510	Karta	51,212	19,684	38%	8%
511	Thorne River	72,970	64,252	88%	28%
512	Ratz	5,322	5,322	100%	2%
Total		193,970	92,232	47%	40%

Notes:

1/ This represents the IRA acres in the project area as a percentage of each IRA.

2/ This represents the IRA acres in the project area as a percentage of the entire project area.

Source: 2001 Roadless Rule Inventoried Roadless Information

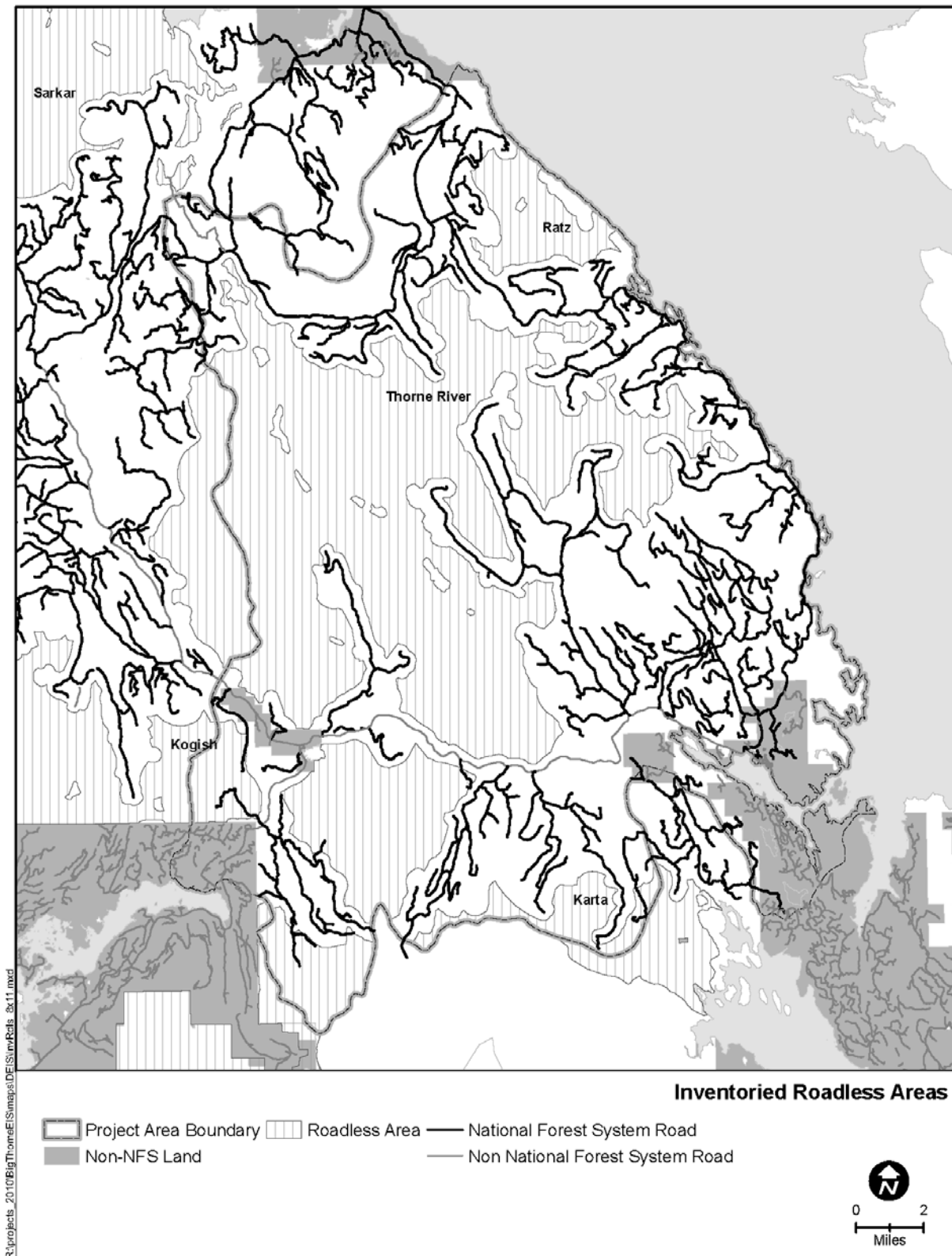


Figure IRA-1. Inventoried Roadless Areas in the Big Thorne Project Area

3 Environment and Effects

The following subsections describe the four IRAs that are partially or fully within the Big Thorne project area. These descriptions draw upon the 2003 Final SEIS IRA characteristics that were incorporated by reference into the 2008 Forest Plan Final EIS (USDA Forest Service 2003a, Volume III Appendix C). For those IRAs only partially located within the project area—the Kogish, Karta, and Thorne River IRAs—the following discussions mainly focus on the portions of the IRA within the project area. The other IRA – Ratz – is entirely located within the project area.

Kogish IRA

The Kogish IRA (#509) is located on the west side of central Prince of Wales Island (Figure IRA-1). The area is bounded to the south by non-NFS lands managed by the State of Alaska and the San Cristoval Channel. The west boundary is formed by the West Coast Waterway, including the Gulf of Esquibel, Tonowek Bay, and Tonowek Narrows. Roads and harvested areas form the boundaries to the north and east of the area. Access to the area is primarily from the Stanley Creek road system to the north or via boat or floatplane to the south and west. Only the easternmost portion of this IRA is located within the Big Thorne project area, and the portion of the IRA within the project area comprises just 5 percent of the total IRA acres (Table IRA-2).

More than half of the Kogish IRA (59 percent) is allocated to development LUDs, with the remaining 41 percent allocated to non-development LUDs (Table IRA-3). Less than half (40 percent) of the portion of this IRA located within the Big Thorne project area is allocated to development LUDs, with the remaining 60 percent allocated to non-development LUDs.

Table IRA-3. Kogish IRA Acres by LUD

Land Use Designation	Total IRA Acres	IRA Acres in the Project Area
Development LUD		
Timber Production	36,270	164
Modified Landscape	834	237
Scenic Viewshed	699	787
Development LUD Total	37,802	1,188
Non-Development LUD		
Old-growth Habitat	4,345	1,787
Semi-remote Recreation	22,319	0
Non-Development LUD Total	26,664	1,787
Overall Total	64,466	2,974

The 2003 Forest Plan SEIS discusses all the values used to rate the Wilderness potential of this IRA (USDA Forest Service 2003a, pp. C2-357 to C2-367). Most of the Kogish IRA appears natural and unmodified; however, the eastern portion, which is in the project area, and the northern boundary, are heavily influenced by nearby developments. In addition, there are approximately 3.4 miles of existing road and 196 acres of past harvest within the portion of the IRA that is in the project area. However, the overall area has high natural integrity and moderate apparent naturalness. When rated separately, the western portion rates out with very high natural integrity and apparent naturalness. The opportunity for solitude is considered high and the opportunity for primitive recreation is very high. Approximately 14 percent of the landscape is considered distinctive for the character type

from a scenery standpoint. The area associated with the western shoreline is rich in cultural history and the roadless area has a few areas of karst development.

Biological Values

There are no unique ecological values in the Kogish IRA. The major fish-producing waters in this IRA are Staney Creek, Shaheen Creek, the streams of Salt Lake Bay, Elevenmile Creek, Big Salt Lake, and Shinaku Creek. The area also includes portions of the Staney Creek headwaters; Staney Creek is a major fish producer. These waters provide habitat for coho, pink, and chum salmon, steelhead trout, and Dolly Varden char. Sitka black-tailed deer, black bear, wolves, marten, mink, river otter, and bald eagles are the best known species that inhabit the area. A number of bald eagle nest sites have been documented along the coastline and inland along Elevenmile Creek.

The only federally listed T&E species likely to occur within or adjacent to the roadless area are the humpback whale (endangered) and the Steller sea lion (threatened). These species, along with the Pacific herring (a candidate species), are found in adjacent marine waters.

Physical Values

Two areas of limestone with potential karst have been identified in this IRA at the head of Nossuk Bay and the Peninsula to Point Swift. Both of these areas are outside the Big Thorne project area. There are no glaciers or unique geologic features known within this area. There are no recreation or other facilities located in this IRA. As a result, demand does not currently exist for domestic water use. There are no existing or planned hydroelectric or domestic water projects.

Social Values

Areas of scientific and educational value in this IRA are limited to the cultural sites along the shoreline. These sites are outside the Big Thorne project area.

Recreation use in this IRA is not well documented and is generally believed to be low because of access difficulties and the lack of recreation attractions, such as major stream or lake systems. Some recreation use occurs along the shoreline, outside the project area.

The existing visual condition of the area is predominantly natural; however, the northern and eastern edges of the IRA have been modified by developments. The more scenic parts of the IRA are concentrated around the relatively rugged and diverse terrain of Kogish Mountain and Staney Cone, and along the intricate shorelines and island groups in Salt Lake Bay and Nossuk Bay. These areas are outside the Big Thorne project area.

There is evidence of prehistoric and historic use of this roadless area, particularly along the saltwater shorelines. The Tlingit people maintain strong connections with specific locations and general areas along the west coast of Prince of Wales Island. Many areas have been identified by local people as important for resource gathering and hunting, including Elevenmile, Salt Lake Bay, and Nossuk Bay, and numerous prehistoric and historic sites have been identified in these areas. None of these areas are in the Big Thorne project area.

3 Environment and Effects

Karta IRA

The Karta IRA (#510) consists of several unconnected roadless sections that surround the Karta Wilderness (Figure IRA-1). The unconnected sections are separated by roads and harvested areas or by wilderness. This IRA includes the Rio Roberts watershed, which is part of a mostly undeveloped, old-growth connection between the Karta Wilderness to the south and Calder Holbrook LUD II area located on the northwest tip of Prince of Wales Island (USDA Forest Service 2003a).

Access to the Karta IRA is via boat or floatplane along Twelvemile Arm and Karta Bay, floatplane via Control Lake or Black Bear Lake, and via the roads along the north, south, and west area boundaries.

The majority of the Karta IRA (78 percent) is allocated to development LUDs, with the remaining 22 percent allocated to non-development LUDs (Table IRA-4). More than half (59 percent) of the portion of this IRA located within the Big Thorne project area is allocated to development LUDs, with the remaining 41 percent allocated to non-development LUDs.

Table IRA-4. Karta IRA Acres by LUD

Land Use Designation	Total IRA Acres	IRA Acres in the Project Area
Development LUDs		
Timber Production	24,820	9,028
Experimental Forest	6,016	0
Modified Landscape	6,533	2,086
Scenic Viewshed	2,387	401
Development LUD Total	39,757	11,515
Non-Development LUDs		
Old-growth Habitat	10,922	8,169
Municipal Watershed	314	0
Semi-remote Recreation	219	0
Non-Development LUD Total	11,456	8,169
Overall Total	51,212	19,684

The 2003 Forest Plan SEIS discusses all the values used to rate the Wilderness potential of this IRA (USDA Forest Service 2003a, pp. C2-368 to C2-378). The Karta Roadless Area appears natural and unmodified, especially near the wilderness, but is often influenced by developments adjacent to most of the other boundaries. In addition, there are approximately 5.4 miles of existing road and 206 acres of past harvest within the portion of the IRA that is in the project area. However, the overall area has moderate natural integrity and apparent naturalness. The opportunity for solitude is high, and the opportunity for primitive recreation is very high; however, during the peak season there is daily floatplane traffic transporting visitors in and out of the wilderness area, and this affects solitude in the Karta Roadless Area.

Biological Values

There are no unique ecological values in the Karta IRA. The primary fish-bearing waters in this roadless area are Control Lake, Steelhead Creek, Rio Roberts Creek, Paul Young Creek, upper Maybeso Creek, and upper Harris River. These waters provide habitat for

coho, pink, chum, and sockeye salmon as well as steelhead and cutthroat trout. Four of the eight VCUs in this area have been identified by ADF&G as primary salmon and sportfish producers, with two others listed as primary sportfish producers.

This area has large populations of Sitka black-tailed deer, black bear, wolves, otter, marten, mink, loon, and common waterfowl. Bald eagle nest sites have been located along the coastline and inland along Rio Roberts Creek. Marbled murrelet, Queen Charlotte goshawk, and harlequin duck may also occur in the area.

The only federally listed threatened and endangered species likely to occur within or adjacent to the roadless area are the humpback whale (endangered) and the Steller sea lion (threatened). These species, along with the Pacific herring (a candidate species) are found in adjacent marine waters.

Physical Values

There are no known karst or cave resources, glaciers, or unique geologic features in this roadless area. Two public recreation cabins in this area create a demand for water. Approximately 373 acres of the area are allocated to the Municipal Watershed LUD and managed to preserve water quality for the community of Klawock.

Social Values

The Maybeso Experimental Forest, one of only two experimental forests on the Tongass National Forest, is partly located in this roadless area, and there are also opportunities to study fish, wildlife, forests, and geologic processes.

This roadless area, which mainly provides semi-primitive recreation opportunities, contains 17 inventoried recreation places; these places cover 10,134 acres, about 18 percent of the roadless area. The historic cabin on Salmon Lake is a one-of-a-kind structure on the National Historic Register. The area is important for subsistence hunting and gathering to the communities of Hydaburg, Klawock, Thorne Bay, and Craig. Ketchikan residents also use the area, primarily for deer hunting.

The existing visual condition of the area is predominantly natural; however, the landscape in approximately 22 percent of the area appears moderately to heavily modified due to logging and roading activity along the northern and southern boundaries.

The roadless area has a rich cultural history of native prehistoric and historic usage. There are prehistoric village sites, rock art, and other physical indications of native occupancy of sites within the area.

Thorne River IRA

The Thorne River IRA (#511) is located approximately 5 air miles northwest of Thorne Bay (Figure IRA-1). Most of the Thorne River drainage is included within this IRA. The IRA is bordered by State Highway 929 to the south, State Highway 925 to the west, and forest roads to the east and north, affording road access to all sides of the area. Two closed road systems provide non-motorized access to the interior of the IRA. The Honker Divide Canoe Route provides water access through the area along Hatchery Creek and the Thorne River.

The majority of the Thorne Bay IRA (71 percent) is allocated to non-development LUDs, with the remaining 29 percent allocated to development LUDs (Table IRA-5). This is also

3 Environment and Effects

the case with the portion of this IRA located within the Big Thorne project area, with 71 percent of the area allocated to non-development LUDs and 29 percent to development LUDs.

The 2003 Forest Plan SEIS discusses all the values used to rate the Wilderness potential of this IRA (USDA Forest Service 2003a, pp. C2-379 to C2-390). The Thorne River IRA is mostly unmodified and appears natural. Roaded areas form all the boundaries and influence the area to some degree, especially in the eastern portion. In addition, there is approximately 0.8 mile of existing road and 86 acres of past harvest within the portion of the IRA that is in the project area. However, the area has overall high natural integrity and apparent naturalness. Separating the eastern lobe out of the area would increase the natural integrity rating to very high. The opportunity for solitude is high, and the opportunity for primitive recreation is very high within the area.

Table IRA-5. Thorne River IRA Acres by LUD

Land Use Designation	Total IRA Acres	IRA Acres in the Project Area
Development LUD		
Timber Production	9,276	7,931
Modified Landscape	9,788	9,814
Scenic Viewshed	2,293	696
Development LUD Total	21,356	18,441
Non-Development LUD		
Old-growth Habitat	39,386	33,652
Research Natural Area	1,620	1,620
Special Interest Area	68	0
Scenic River	10,540	10,540
Non-Development LUD Total	51,614	45,811
Overall Total	72,970	64,252

Biological Values

The major fish-bearing waters in this area are Thorne River, Thorne Lake, Hatchery Creek, Lake Galea, and Logjam Creek. The headwaters for Logjam Creek provide habitat for coho salmon. This area has large populations of Sitka black-tailed deer, black bear, wolves, otter, marten, mink, and bald eagles. The only known inland-nesting bald eagles in Southeast Alaska are located in the Thorne-Hatchery Creek area.

The Thorne River connects a series of large lakes that are a special feature of this roadless area. This IRA also includes a large block of old-growth habitat that is part of the Forest-wide conservation strategy.

The only federally listed threatened and endangered species in the Tongass are the humpback whale (endangered) and the Steller sea lion (threatened), both marine species. In addition, Pacific herring is a candidate species. There is no marine habitat available in the Thorne River Roadless Area. Four Forest Service Region 10 Sensitive Species are suspected or known to occur within the area: the trumpeter swan, osprey, Peale's peregrine falcon, and the Queen Charlotte goshawk.

Physical Values

Three small areas of karst are located in the hills southwest of Cutthroat Lake and several small caves have been mapped in this roadless area. The topography of the lower Thorne

River is dominated by drumlins, which control the vegetation and hydrology of the area. There are no glaciers in the area.

The one public recreation cabin on Honker Lake creates the only water demand in the entire area. There are no existing or planned hydroelectric or domestic water projects within the roadless area.

Social Values

The Rio Roberts Research Natural Area is located within the roadless area. This Research Natural Area contains riparian flood plain spruce stands, upland old growth forest, natural second-growth stands, and upland hemlock on drumlin fields (glacial features). Research Natural Areas provide opportunities for baseline monitoring of ecological processes and non-manipulative observation.

This Research Natural Area provides primarily semi-primitive recreation opportunities. Opportunities for solitude and serenity are high, especially along the Thorne River corridor and adjacent upland areas. The natural integrity of this area is intact and largely unmodified except for one recreation use cabin (Honker Lake Cabin) and a small trail system. The majority of the area appears natural, with the exception of areas around the boundaries of the IRA where the landscape character is influenced by adjacent development.

At least one cultural site along the Thorne River, a prehistoric campsite, has been determined to be eligible for listing on the National Register of Historic Places. Because of the high-value fish resources of the Thorne River, the prehistoric and historical use of this area was probably relatively high.

Ratz IRA

The Ratz IRA (#512) is located on the east side of Prince of Wales Island, approximately 5 air miles south of Coffman Cove and 15 air miles north of Thorne Bay (Figure IRA-1). This IRA is bounded to the northeast by Clarence Strait, with roads and harvested areas forming the IRA's other boundaries. Access to the area is via boat or floatplane through Ratz Harbor, by floatplane and the unnamed lake located north of Baird Peak within the IRA, or by foot from the roads along the boundaries of the area.

The majority of the Ratz IRA (85 percent) is allocated to development LUDs, with the remaining 15 percent allocated to non-development LUDs (Table IRA-6). The entire IRA is located within the project area.

3 Environment and Effects

Table IRA-6. Ratz IRA Acres by LUD

Land Use Designation	Total IRA Acres	IRA Acres in the Project Area
Development LUD		
Modified Landscape	4,515	4,515
Development LUD Total	4,515	4,515
Non-Development LUD		
Old-growth Habitat	808	808
Non-Development LUD Total	808	808
Overall Total	5,322	5,322

The 2003 Forest Plan SEIS discusses all the values used to rate the Wilderness potential of this IRA (USDA Forest Service 2003a, pp. C2-391 to C2-399). The Ratz IRA has moderate to low scenic quality; none of the landscape is classified as distinctive from a scenery standpoint. The karst on Baird Peak is a special feature of this roadless area. This small roadless area is in a natural, unmodified condition and has a high level of natural integrity. The opportunity for solitude within the area is moderate due to the area's relatively small size. Nearby management activities and road traffic may be heard especially along the north, south and western boundaries. The opportunity for primitive recreation is relatively high, but decreases toward the edges of the area. This IRA includes approximately 0.3 mile of existing road and 12 acres of past harvest.

Biological Values

There are no unique ecological values in the area. There are no anadromous fish-bearing waters in this roadless area. The area has populations of Sitka black-tailed deer, black bear, wolves, and other animals and birds common to Prince of Wales Island. Migrating trumpeter swan and goshawks use this area.

The only federally listed threatened and endangered species in the Tongass are the humpback whale (endangered) and the Steller sea lion (threatened), both marine species. These species, along with the Pacific herring (a candidate species), are found in adjacent marine waters.

Physical Values

The northeast flank of Baird Peak is underlain by marble into which extensive karst systems have developed. The karst in the northeastern portion of the roadless area contains several small caves. There are no sources of public drinking water in this IRA.

Social Values

The intensely developed karst on the northeast face of Baird Peak, as well as forests and wildlife, are of scientific interest.

This IRA provides primarily semi-primitive recreation opportunities. There are no developed recreation facilities in this area. The area receives some dispersed recreation and subsistence use, primarily hunting and fishing.

About 60 percent of the landscape in this roadless area appears natural and unaltered by human activity. The visual condition of the remainder of the area appears moderately to heavily altered due to developments around the periphery of the area.

It is likely that there has been some native prehistoric and historic use within the roadless area, but this has not been confirmed through cultural resource investigations.

Unroaded Areas

Unroaded areas are generally less than 5,000 acres in size and do not meet the minimum criteria for wilderness consideration under the Wilderness Act. The inventory for the 2003 Forest Plan Revision SEIS, which was subsequently updated for the 2008 Forest Plan Amendment, identified five unroaded areas that are partially within the Big Thorne project area, with a combined total area of 12,284 acres, 6,554 acres of which are located within the project area. The 2003 Forest Plan Revision SEIS analyzed these unroaded areas and found they did not have wilderness potential due to their size and/or configuration.

No standards and guidelines to maintain the physical, biological and social characteristics of unroaded areas have been established in the Forest Plan or national direction. Therefore, changes to these areas, as a result of timber harvest activities, are acceptable under the Forest Plan and effects are generally expected to be similar to those in nearby roaded areas.

Wilderness

Karta River Wilderness

The Big Thorne project area is bordered to the south by the Karta River Wilderness. The Karta River Wilderness consists of 39,894 acres located about 5 miles by water from Kassan and Hollis. The area includes the drainage of the Karta River system (which empties into the southwest corner of Karta Bay) and two major lakes, Salmon and Karta. The Karta River Wilderness is known for its rugged, alpine beauty and the Karta River drainage is considered to be a high quality fishery. Wildlife in the area includes wolves, black bears, black-tailed deer, beavers, otters, mink, marten, and trumpeter swans and other waterfowl are often seen on the river. The Karta River Wilderness is a popular destination for subsistence fishing and recreation. The majority of use in this Wilderness occurs along the Karta River corridor.

Environmental Consequences

Inventoried Roadless Areas

None of the alternatives propose old-growth harvest units, young-growth thinning units, new roads, or reconstructed roads within IRAs and, as a result, there would be no direct impacts to IRAs. Two of the alternatives (Alternatives 3 and 4) would, however, involve adjustments to the boundaries of small OGRs outside of IRAs so that more of these OGRs are placed within IRAs in the project area. The potential effects of these changes to IRAs are discussed below by alternative.

Indirect effects on the roadless area character may occur as a result of project activities that take place outside the boundaries of the IRA. The analysis presented in this section assesses indirect effects on roadless area characteristics as a result of “zones or areas of influence” that include a 600-foot buffer around old-growth units and a 1,200-foot buffer

3 Environment and Effects

placed around roads (USDA Forest Service 2003c). Table IRA-7 identifies the IRA acres that would fall within these buffers by alternative.

Table IRA-7. Area of Influence by Alternative (acres)

Inventoried Roadless Area ^{1/}	Total IRA Acres in the Project Area	Area of Influence by Alternative (acres)				
		1	2	3	4	5
509 - Kogish	2,974	0	10	103	10	11
510 - Karta	19,684	0	193	192	349	274
511 - Thorne River	64,252	0	709	1,010	560	654
512 - Ratz	5,322	0	225	417	165	141
Total	92,232	0	1,137	1,722	1,084	1,080

Note:

1/ The Area of Influence for each alternative is the total area within 1,200 feet of a new road or within 600 feet of an old-growth harvest unit (including helicopter harvest units).

Wilderness

None of the proposed alternatives would affect the Karta River Wilderness because no timber harvest or related activities are planned within the Wilderness area. In addition, the Karta River Wilderness character is primarily centered around the productive Karta River system. Sights and sounds of timber harvest activities within the Big Thorne project area to the north would not travel to the river system. As a result, the biological, physical, and social aspects of the Karta River Wilderness would not be affected by any of the proposed alternatives. Therefore, there would be no direct, indirect, or cumulative effects to the Karta River Wilderness under any of the alternatives, and the following alternative-specific discussions address IRAs only.

Alternative 1 – No Action

Direct and Indirect Effects

Alternative 1 would have no direct or indirect effects on IRAs because there would be no timber harvest or road construction/reconstruction under this alternative.

Cumulative Effects

Alternative 1 would have no cumulative effects on IRAs because there would be no timber harvest or road construction/reconstruction under this alternative.

Alternative 2 – Proposed Action

Direct and Indirect Effects

Alternative 2 would not include any old-growth harvest units, young-growth thinning units, new roads, or reconstructed roads within any of the IRAs in the Big Thorne project area and therefore, it would not have any direct effects. There are no proposed changes to IRAs under this alternative. Road construction and timber harvest under this alternative could indirectly influence roadless characteristics on about 1,137 acres or 1.2 percent of the 92,232 acres in the four IRAs located in the project area (Table IRA-7). This acreage represents less than 1 percent of the 193,970 total acres within the four IRAs (including areas outside the project area). This alternative is not expected to adversely impact the biological, physical, and social values associated with the IRAs in the project area.

Cumulative Effects

Alternative 2 would not directly affect the IRAs in the project area and indirect effects are not expected to adversely impact the biological, physical, and social values associated with the IRAs. As a result, this alternative is not expected to incrementally add to cumulative effects to IRAs. Present and reasonably foreseeable projects in the Big Thorne project area are discussed at the beginning of Chapter 3 in the Known Projects in the Big Thorne Project Area section.

Alternative 3

Direct and Indirect Effects

Alternative 3 would not include any old-growth harvest units, young-growth thinning units, new roads, or reconstructed roads within any of the IRAs in the Big Thorne project area. Changes to existing LUDs would occur within the IRAs in the project area as a result of changes to the boundaries of small OGRs. These changes should have the effect of providing additional protection to these IRAs due to stronger LUD protections. Changes to existing LUDs would occur in all four IRAs in the project area under this alternative. These changes may be summarized as follows, with changes in LUDs compared to the entire IRA, not just the portion in the Big Thorne project area.

- § Kogish IRA—644 acres currently allocated to the Timber Production, Modified Landscape, and Scenic Viewshed LUDs would be changed to the Old-growth Habitat LUD, a net gain of about 2 percent in total non-development LUD acres in this IRA.
- § Karta IRA—231 acres currently allocated to the Timber Production LUD would be changed to the Old-growth Habitat LUD, a net gain of about 2 percent in total non-development LUD acres in this IRA.
- § Thorne River IRA—4,490 acres currently allocated to the Timber Production and Modified Landscape LUDs would be changed to the Old-growth Habitat LUD, a net gain of about 9 percent in total non-development LUD acres in this IRA.
- § Ratz IRA—1,002 acres currently allocated to the Modified Landscape LUD would be changed to the Old-growth Habitat LUD, more than doubling the 808 acres (a net gain of 124 percent) currently allocated to non-development LUDs in this IRA.

Road construction and timber harvest under this alternative could indirectly influence roadless characteristics on about 1,722 acres or about 1.9 percent of the 92,232 acres in the four IRAs located in the project area (Table IRA-7). This acreage represents less than 1 percent of the 193,970 total acres within the four IRAs (including areas outside the project area). This alternative is not expected to adversely impact the biological, physical, and social values associated with the IRAs in the project area.

Cumulative Effects

Changes to existing LUDs within IRAs would occur under Alternative 3, but these changes should have the effect of providing additional protection to these IRAs due to stronger LUD protections. Alternative 3 would not directly affect the IRAs in the project area and indirect effects are not expected to adversely impact the biological, physical, and

3 Environment and Effects

social values associated with the IRAs. As a result, this alternative is not expected to incrementally add to cumulative effects to IRAs.

Alternative 4

Direct and Indirect Effects

Alternative 4 would not include any old-growth harvest units, young-growth thinning units, new roads, or reconstructed roads within any of the IRAs in the Big Thorne project area. Changes to existing LUDs would occur within the IRAs in the project area as a result of changes to the boundaries of small OGRs. These changes should have the effect of providing additional protection to these IRAs due to stronger LUD protections. Changes to existing LUDs would occur in three of the four IRAs in the project area under this alternative. These changes may be summarized as follows, with changes in LUDs compared to the entire IRA, not just the portion in the Big Thorne project area.

- § Kogish IRA—1,041 acres currently allocated to the Timber Production, Modified Landscape, and Scenic Viewshed LUDs would be changed to the Old-growth Habitat LUD, a net gain of about 4 percent in total non-development LUD acres in this IRA.
- § Karta IRA—666 acres currently allocated to the Timber Production, Modified Landscape, and Scenic Viewshed LUDs would be changed to the Old-growth Habitat LUD, a net gain of about 6 percent in total non-development LUD acres in this IRA. In addition, 121 acres of Modified Landscape and Scenic Viewshed would be changed to Timber Production.
- § Ratz IRA—442 acres currently allocated to the Modified Landscape LUD would be changed to the Old-growth Habitat LUD, a net gain of about 55 percent in total non-development LUD acres in this IRA.

Road construction and timber harvest under this alternative could indirectly influence roadless characteristics on about 1,084 acres or about 1.2 percent of the 92,232 acres in the four IRAs occurring within the project area. This acreage represents less than 1 percent of the 193,970 total acres within the four IRAs (including areas outside the project area). This alternative is not expected to adversely impact the biological, physical, and social values associated with the IRAs in the project area.

Cumulative Effects

Changes to existing LUDs within IRAs would occur under Alternative 4, but these changes should have the effect of providing additional protection to these IRAs due to stronger LUD protections. Alternative 4 would not directly affect the IRAs in the project area and indirect effects are not expected to adversely impact the biological, physical, and social values associated with the IRAs. As a result, this alternative is not expected to incrementally add to cumulative effects to IRAs.

Alternative 5**Direct and Indirect Effects**

Alternative 5 would not include any old-growth harvest units, young-growth thinning units, new roads, or reconstructed roads within the IRAs. Road construction and timber harvest under this alternative could indirectly influence roadless characteristics on about 1,080 acres or about 1.2 percent of the 92,232 acres in the four IRAs located in the project area. This acreage represents less than 1 percent of the 193,970 total acres within the four 2001 IRAs (including areas outside the project area). This alternative is not expected to adversely impact the biological, physical, and social values associated with the IRAs in the project area.

Cumulative Effects

Alternative 5 would not directly affect the IRAs in the project area and indirect effects are not expected to adversely impact the biological, physical, and social values associated with the IRAs. As a result, this alternative is not expected to incrementally add to cumulative effects to IRAs.

3 Environment and Effects

Wild and Scenic Rivers

Introduction

There are no designated Wild and Scenic Rivers on Prince of Wales Island and associated islands. However, during the 1997 Forest Plan revision, five river/lake systems were determined eligible and suitable for designation, and have been recommended for inclusion in the Wild and Scenic River System: Essowah Lakes and streams, Kegan Lake and streams, Salmon Bay Lake and stream, Sarkar Lakes, and Thorne River/Hatchery Creek/Barnes Lake.

Affected Environment

Within the project area is a portion of the Thorne River/Hatchery Creek/Barnes Lake recommended Wild and Scenic River that, in its entirety, runs up the Thorne River from Thorne Bay to its headwaters and down Hatchery Creek through Sweetwater Lake to Lake Bay near Coffman Cove. The segments that fall within the project area are classified as scenic and recreational and allocated to the Scenic River and Recreational River LUDs, respectively. The recreational segment represents the lower Thorne River and the remainder, which represents the majority in the project area, is scenic. This river is recommended for the following outstandingly remarkable values:

- § Fish—Fishing opportunities exist throughout most of the year. Sport species include coho, sockeye, chum, and pink salmon, as well as cutthroat, rainbow, and steelhead trout and Dolly Varden char. Thorne River produces the largest run of steelhead on Prince of Wales Island, and the watershed is listed among the 19 “high quality” watersheds identified by ADF&G in Southeast Alaska for fisheries values.
- § Wildlife—Extensive wetlands areas provide habitat for waterfowl, loons, great blue herons, and trumpeter swans. Sweetwater Lake is important wintering area for trumpeter swans. Other wildlife species that occur in the corridor are bald eagles, black bear, wolves, river otter, seals, marten, mink, weasels, beaver, and Sitka black-tailed deer. The only known inland-nesting bald eagles in Southeast Alaska occur in the Thorne-Hatchery area.
- § Recreation—Sport fishing use is extensive due to the diverse sport species available. Convenient road access and three public reservation cabins along the corridor bring visitors to the area. Extensive canoe opportunities exist with the Honker Divide Canoe Route, which starts at Hatchery Creek Bridge on the Coffman Cove Road and traverses 30 miles of streams and lakes ending at the city dock in Thorne Bay. Opportunities for wildlife viewing are also a draw and subsistence hunting is a common activity in the area.
- § Scenery—The river corridor offers a diverse landscape for scenery with contrasting elements of rock, old-growth forest, muskegs, alpine, meadows, and rounded mountains. The chain of lakes along the Honker Divide Canoe Route are interconnected by streams and portages and allow visitors to view unique wetlands, and diverse shorelines and stream channels.

The goals for the Scenic River and Recreational River LUDs include managing the scenic or recreational river “segments to maintain their outstandingly remarkable values and classification eligibility until Congress designates the segments or decides not to designate them” (USDA Forest Service 2008a, p. 3-81, 3-88).

Environmental Consequences

Direct and Indirect Effects

Scenic River LUD

The major portion of the Scenic River LUD lies inside the Big Thorne project area boundary. None of the alternatives propose timber harvest or road construction within the Scenic River LUD, resulting in no direct, indirect, or cumulative impacts.

Recreational River LUD

The Recreational River LUD includes the lower Thorne River from about a mile upstream of the mouth of Goose Creek to Thorne Bay, including the estuary of the Thorne River. The LUD generally includes lands within 0.25 mile of the stream or estuary. Two proposed old-growth harvest units and one proposed commercial thinning unit for the Big Thorne project are partially within the Recreational River LUD. Approximately 11 acres of old-growth Unit 597.1-62 is within the Recreational River LUD along the north side of the Thorne River just west of the beginning of the North Thorne River Road. The closest portion of the unit is about 1,000 feet from the Thorne River. The southern 27 acres of old-growth Unit 579-119 is within the Recreational River LUD in the vicinity of Gravelly Creek. The closest portion of this unit is about 900 feet from the Thorne River and on the other side of the highway. A portion of young-growth thinning Unit 586-516 is within the Recreational River LUD, near the southwest shore of the Thorne River mouth. Table WSR-1 shows harvest acres proposed by alternative in Recreational River LUD.

Table WSR-1. Harvest and Thinning Acres Proposed within the Recreational River LUD

Unit	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
5971-62	0	11	11	0	11
5790-119	0	27	27	0	27
5860-516	0	0	33	33	33
Total Old-Growth Harvest Acres	0	38	38	0	38
Total Young-Growth Thinning Acres	0	0	33	33	33

Alternative 1 does not propose harvest or road construction and would not affect the Recreational River LUD. All of the action alternatives propose timber harvest within this LUD. Timber harvest is compatible with the Recreational River LUD, as long as the adjacent LUD allows it and the activity emphasizes enhancement or maintenance of the outstandingly remarkable river values. The adjacent LUD to these harvest and commercial thinning units is Modified Landscape, which allows timber harvest. The alternatives proposed in the Big Thorne Project would not significantly affect the outstandingly remarkable conditions for which the Thorne River-Hatchery Creek segments were recommended, and would not affect the eligibility of this river for inclusion in the Wild and Scenic River System (as discussed below).

3 Environment and Effects

The Thorne River and Hatchery Creek system is recommended as eligible for inclusion in the Wild and Scenic River System because it is outstandingly remarkable for fish, wildlife, recreation, and scenery. These outstandingly remarkable values are described in the Affected Environment section, above. The following paragraphs assess the potential impact of the proposed action alternatives on these outstandingly remarkable values.

- § Fish—Implementation of the applicable Forest Plan standards and guidelines and best management practices would mitigate potential impacts to fisheries. As a result, none of the alternatives are expected to have measurable effects on fish habitat and are, therefore, unlikely to affect the outstandingly remarkable fishing opportunities in the Thorne-Hatchery system or elsewhere in the Big Thorne project area.
- § Wildlife—None of the alternatives would affect the wetland areas along the river corridor that provide habitat for waterfowl, loons, great blue herons, and trumpeter swans. There would also be no effect to Sweetwater Lake, which is identified as an important wintering area for trumpeter swans or the other wildlife species that are identified as occurring in the corridor. Potential reductions in deer habitat capability in the WAAs that coincide with the Big Thorne project area could have minor project area-wide impacts on Sitka black-tailed deer populations, but are unlikely to noticeably affect populations along the river corridor.
- § Recreation—None of the alternatives would affect sport fishing opportunities or use of the Honker Divide Canoe Route, both of which are important aspects of the recreation activities along this river corridor that are considered outstandingly remarkable. There would also be no effect to potential wildlife viewing and hunting opportunities along the river corridor.
- § Scenery—None of the alternatives would affect the diversity of the landscapes that are visible from the river corridor or the wetlands, diverse shorelines, and stream channels that characterize the river corridor itself. Under Alternative 3, four to eight units (located between 0.75 and 1 mile from the river corridor) would be partially visible in the middleground from some portions of the lakes along the Honker Divide trail near the middle of the corridor. Harvest in these areas would be consistent with the Forest Plan and not expected to affect the scenic values that are considered outstandingly remarkable.

Cumulative Effects

Past, present, and reasonably foreseeable future actions considered in this analysis are listed at the beginning of this chapter. None of the alternatives would affect the eligibility of the Thorne River-Hatchery Creek segments for inclusion in the Wild and Scenic River System and would, therefore, not add incrementally to cumulative impacts on wild and scenic rivers.

Heritage Resources

Introduction

This section provides an overview of the archaeological investigation of the potential effects of the proposed Big Thorne project on existing historical properties eligible to the National Register of Historic Places (NRHP), as required by the Act and its application guidance.

Heritage resources include a wide array of historic and prehistoric cultural sites and traditional cultural properties. The Forest Service conducts heritage resource investigations under the provisions set in the Third Programmatic Agreement (as amended) between the Alaska Region of the USDA Forest Service, the Alaska State Historic Preservation Officer and the Advisory Council on Historic Preservation (Programmatic Agreement). This agreement was developed to utilize more cost-effective, streamlined steps and procedures than those outlined in 36 CFR 800 and to develop a flexible programmatic approach for expeditiously implementing Section 106 of the National Historic Preservation Act (NHPA). This agreement is in keeping with and adheres to the guidance provided in Forest Service policy FSM 2360.

Consideration of the effects of the Big Thorne undertaking consisted of (1) defining the Area of Potential Effects (APE); (2) conducting a review of existing historic and archaeological information about the project area including the results of past heritage surveys, and through consultations with affected tribes and groups; (3) implementation of additional fieldwork deemed necessary to assess potential effects; (4) development of recommendations based on the results of 1, 2, and 3; and (5) consultation with the State Historic Preservation Officer to seek concurrence with recommendations regarding significance and effect.

Methodology

Past and Current Archaeological Survey in Big Thorne Project Area

The lands immediately surrounding the Big Thorne project area have received substantial archaeological survey coverage during the planning process of several major timber harvest proposals, some of which included areas within the currently proposed project. They include the North Thorne Timber Harvest Project (2005), Logjam Timber Sale Project (2008), *Archaeology of Thorne Bay: A Survey of 22 Timber Harvest Units on Prince of Wales Island* (Ackerman et al. 1987a), *Southeast Alaska, The Control Lake Environmental Impact Statement, Prince of Wales Island* (Greiser 1994), *The Coffman Cove Archaeological Survey, Archaeology of Coffman Cove: A Survey of 15 Timber Harvest Units on Prince of Wales Island* (Ackerman et al. 1987b), Southeastern Alaska, the Cobble Timber Project (2004) and numerous cultural resource surveys reported in the Central Prince of Wales EIS (1987–1995).

The North Thorne timber sale project was located northwest of the community of Thorne Bay and covered about 35,750 acres of NFS lands which included portions of the Big Thorne Project. Archaeologists surveyed over 1,400 acres but did not find any significant cultural remains.

3 Environment and Effects

The Thorne Bay archaeological survey conducted by William Ackerman in 1987 included an area extending from the head of Kasaan Bay northward into the Thorne River Valley and west to Control Lake. A total of 1,420 acres were surveyed and 193 test pits dug. No historic or prehistoric sites were found.

The Coffman Cove archaeological survey conducted by William Ackerman in 1987 included an area extending from Luck Lake on the east coast of Prince of Wales Island to Hatchery and Logjam Creeks south of Sweetwater Lake and then to Tuxekan Passage on the western coast of the island. A total of 450 acres were surveyed and 127 test pits dug. No artifacts or cultural remains were identified.

The Control Lake project was located west of the Big Thorne Project and included much of the western portion of the project area. A total of 1,800 acres were intensively surveyed as part of the Control Lake project immediately west of the North Thorne project in VCU's 571, 574, 575, 576, 577, and 597. An additional 250 acres in the same area received reconnaissance survey. No cultural resources were identified.

Archaeological survey was undertaken for the Logjam Timber Sale which was located northwest of the Big Thorne Project. Survey of proposed timber harvest units included 334 acres of pedestrian survey. The only cultural properties located were cultural modified trees (CMTs).

The formerly proposed Cobble Timber Project covered 40,394 acres including sections of the proposed Big Thorne project area. Of these acres, 2,770 were surveyed and 520 acres were cleared during past surveys. Despite extensive survey coverage, there was only one poorly defined fish trap, 22 CMTs and one abandoned logging camp for the entire project area. Most recent survey was done in 2003. It included 13 low probability units over approximately 118 acres and produced no cultural materials.

During the field seasons from 2009 to 2011, a team of Forest Service archaeologists conducted intensive surveys of the Big Thorne project area using the methodology stipulated in the Programmatic Agreement, covering the necessary areas considered high sensitivity and a percentage of areas considered low sensitivity. Through the Programmatic Agreement, the Forest Service recognizes two sensitivity zones in the Alaska Region: high and low. Sensitivity zones are dynamic estimates or approximations based on interpretation of data from previous cultural resource investigations. Over 2,300 acres of high and low sensitivity acres were cleared by Forest Service Heritage archaeological crews. As a direct result of the fieldwork conducted, 11 prehistoric sites and 3 three CMTs were recorded. None of the sites or CMTs found during the investigation was evaluated as to eligibility to the NHRP and as such is considered eligible to the Register for management purposes.

Monitoring

The Programmatic Agreement stipulates how archaeological monitoring is to be conducted for the proposed project. The agreement states that a sample of all areas of high archaeological sensitivity will be subject to direct impact is to be monitored during and/or after the actual ground disturbance. The impact areas to be monitored will be determined on a case-by-case basis. For areas considered low sensitivity, a sample of all areas of actual ground disturbance is to be subjected to post-disturbance monitoring. The

locations and acreage sampled will be determined on a case-by-case basis. Monitoring of these areas will commence with the start of the project's harvest work and will conclude with some post-disturbance surveys.

Affected Environment

Heritage Resources in the Project Area

There are 25 recorded sites within a 2-mile radius of the proposed Big Thorne Project. These include the following sites:

CRG-00019	CRG-00162	CRG-00223	CRG-00317	CRG-00388
CRG-00033	CRG-00177	CRG-00265	CRG-00318	CRG-00547
CRG-00035	CRG-00191	CRG-00314	CRG-00319	CRG-00582
CRG-00053	CRG-00192	CRG-00315	CRG-00340	CRG-00602
CRG-00158	CRG-00193	CRG-00316	CRG-00350	CRG-00603

These sites are predominantly prehistoric in nature and include shell middens, petroglyphs, house pits, a trail and multiple fish weirs or traps (both wooden and stone in composition). Two of the sites are historic mines. Only a very small portion of the recorded sites have been evaluated as to their eligibility for the NRHP and are considered eligible for management purposes. In close proximity to the project area is the historic Salt Chuck Mine (CRG-019) which has been evaluated in the past as eligible for the NRHP. The prehistoric Thorne River Site (CRG-177) is found within the overall boundary of the project, but not in the project APE. No project activities are within 1 mile of its location. It has been evaluated and is considered eligible for the NRHP.

Additionally, found adjacent to the northern boundary of the project area is a large group of CMTs. An archaeological team recorded 352 CMTs during surveys conducted in 2001.

Environmental Consequences

The APE for all alternatives is considered to be the project area as defined in this document. Direct effects include damage due to harvest activities and road construction activities. Therefore, areas of direct effect are defined as planned harvest units and road corridors. Indirect effects result from activities peripheral to the harvest itself. These would include the risk of increased damage of historic properties due to increased visitation of the project area. Increased visitation might result from higher numbers of workers in the area during harvest or from increased accessibility to the area due to road improvements.

Cumulative effects to heritage resources result from the collective impacts of natural decay, erosion, and forest processes as well as modern cultural processes, which may include recreational artifact collection and vandalism of historic properties and developments such as timber harvest and road construction. Portions of the Big Thorne project area have road access and receive recreation use at present. The planned timber harvest will not significantly increase the use of the project area by the public, nor will it contribute to increased potential impacts to heritage resources.

3 Environment and Effects

As stated in the Programmatic Agreement Section VII B and the 2008 Tongass Land and Resource Management Plan, Heritage Resource Activities, section HSS1B, the preferred management of sites listed in, nominated to, or eligible for the NRHP is avoidance and protection. All of the sites previously recorded within the APE of the project and the sites found during the survey for the project will be fully avoided. As per the Programmatic Agreement, while there are historic properties present in the APE, the project would have no effect upon them as defined at 36 CFR 800.16(i).

The imposition of a 1,000-foot coastal buffer aids in the avoidance of heritage properties because it removes the majority of the harvest and road construction activities from most of the areas with the highest potential for the occurrence of heritage sites. Planned harvest units are, for the most part in low-sensitivity areas for heritage resources.

Direct and Indirect Effects (All Alternatives)

Alternative 1, Direct and Indirect Effects

Alternative 1, the No-action Alternative, would result in no changes to the existing condition. Recreation and subsistence uses associated with modern lake and marine shorelines, as well as activities associated with existing roads facilitate access to locales of high sensitivity for heritage resources. Alternative 1 would not change that situation.

Alternatives 2, 3, 4 and 5, Direct and Indirect Effects

Based on the results of the archaeological examination of the APE for the undertaking, Alternatives 2 through 5 contain no proposed harvest units or roads that would have a direct and significant effect on existing historic properties. All historic properties found during the field investigation or prior to investigation were used to modify the project to totally avoid project effects. For heritage purposes, the effects of the alternatives are No Historic Properties Affected. For Alternatives 2, 3, 4, and 5, there would be no direct effects.

Harvest and road construction would not significantly increase access and visitation to areas of high sensitivity for heritage resources. All proposed roads would be decommissioned or put into storage after harvest activities are complete. No indirect effects are anticipated from these alternatives.

Cumulative Effects (All Alternatives)

Cumulative effects of past projects on heritage resources in the Big Thorne project area are considered minimal. The majority of the harvest and road construction activities are in areas not considered high potential for heritage resources or near known historic properties. Project activities are not expected to contribute to the degradation of historic properties in the project area. This will be confirmed or refuted by the monitoring activities conducted during the implementation of the project and after it has concluded. Therefore, the project is not expected to contribute to cumulative effects.

Tribal Consultation

Consultations have been and continue to be conducted with the tribal governments and Native corporations of Craig, Klawock, Hydaburg, and Kasaan. The details of the project

have been offered to all of the tribes on the island yearly at the Prince of Wales Forest Service Tribal Consultation Meeting beginning in 2009. No concerns have been forwarded to the Forest Service from the associated tribes relative to the project.

The Heritage Resource Report (R2009100554008) will be sent for review and consultation to the Alaska State Historic Preservation Officer. As per the Programmatic Agreement if there are historic properties present but the undertaking will have no effect upon them as defined at 36 CFR 800.16(i), then the Heritage Specialist may make a determination of “No Historic Properties Affected” and the Forest may proceed with the undertaking in lieu of a consensus determination of eligibility pursuant to 36 CFR 800.4. 36 CFR 800.16(1) states that “effect” means alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register. Since all the known historic properties have been removed from the APE for this undertaking and will be fully avoided, the characteristics of the historic properties eligible to the NRHP will not be impacted.

NHPA Section 106 Compliance

In previous years heritage resource surveys of various intensities were conducted in the project APE. For this undertaking over 2,300 acres of applicable areas of the APE had archaeological investigations according to the guidance provided in the Programmatic Agreement. A finding of “no historic properties affected” was recommended for all alternatives for the Big Thorne Project. Under the terms of the existing Programmatic Agreement, the Forest will proceed with the project in lieu of a consensus determination of eligibility pursuant to 36 CFR 800.4.

3 Environment and Effects

Socioeconomics

Affected Environment

The primary social and economic area of influence for the Big Thorne Project includes those communities located in close proximity to the project area (within 12 miles) whose residents use the project area for subsistence, recreation, and other activities. It also includes communities with economic activities that could be affected by the proposed project, primarily wood products operations that could use the timber from the project area. The communities that fall into one or more of these categories are Thorne Bay, Coffman Cove, Klawock, Craig, Hollis, Kasaan, and Naukati Bay. Profiles are presented for each of these communities in the Community Profiles section, at the beginning of this chapter.

The following sections address demographic characteristics and trends, economic conditions, and non-market values. The discussion and analysis presented in these sections tiers to the detailed socioeconomic information and analysis presented in Chapter 3 of the 2008 Forest Plan EIS (USDA Forest Service 2008c).

Demographic Characteristics and Trends

Population Trends

Southeast Alaska had an estimated population of 74,423 in 2012, with slightly more than two-thirds (67 percent) of that total concentrated in three cities: Juneau, Ketchikan, and Sitka (Alaska DOL 2012a). The remaining population is distributed throughout the region in more than 30 small communities, most with populations of less than 1,000 residents. Wrangell, Petersburg, and Ketchikan are the closest of the larger population centers to the project area.

The Big Thorne project area is located on Prince of Wales Island and is part of the Prince of Wales-Hyder CA.¹ The Prince of Wales-Hyder CA consists of Prince of Wales Island and the communities of Metlakatla and Hyder, and encompasses approximately 3,900 square miles, with an average population density of 1.4 persons per square mile (U.S. Census Bureau 2011a). In 2010, total population in the Prince of Wales-Hyder CA was 5,559, with 4,012 or 72 percent of this total residing on Prince of Wales Island (Table SOC-1). Total population in the communities located in or near the project area ranged from 49 in Kasaan to 1,201 in Craig (Table SOC-1). Thorne Bay had a total population of 471 in 2010.

Total population increased by 13 percent in Alaska over the past decade (2000 to 2010), with much of this increase due to natural increase (more births than deaths in the existing population). The State also saw small gains in population through net in-migration (more people moving to the area than leaving) (Alaska DOL 2010). Population in Southeast Alaska decreased by about 2 percent between 2000 and 2010; population grew through

¹ In 2010, Southeast Alaska was divided into seven boroughs and three census areas. The seven boroughs correspond with the county governments found elsewhere in the United States. The remaining unorganized area was allocated to three CAs: Hoonah-Angoon, Petersburg, and Prince of Wales-Hyder. CAs are statistical units that are generally recognized as county equivalents from a data reporting standpoint. (Note that Petersburg has since become a borough).

natural increase (6 percent), but these gains were outweighed by the number of people leaving the region (8 percent) (Alaska DOL 2010).

Table SOC-1. Population, 2000 and 2010

Geographic Area/Community^{1/}	2000	2010	Absolute Change	Percent Change
Coffman Cove	199	176	-23	-12%
Craig	1,397	1,201	-196	-14%
Hollis CDP	139	112	-27	-19%
Kasaan	39	49	10	26%
Klawock	854	755	-99	-12%
Naukati Bay CDP	135	113	-22	-16%
Thorne Bay	557	471	-86	-15%
Prince of Wales Census Subarea^{2/}	4,581	4,012	-569	-12%
Prince of Wales-Hyder CA ^{3/}	6,146	5,559	-587	-10%
Southeast Alaska	73,082	71,664	-1,418	-2%
Alaska	626,932	710,231	83,299	13%

Notes:

CA – Census Area

CDP – Census Designated Place

1/ CDPs are unincorporated communities identified by the Census for statistical purposes. Two of the seven communities within 12 miles of the project area—Hollis and Naukati Bay—are designated CDPs. The other five—Coffman Cove, Craig, Kasaan, Klawock and Thorne Bay—are incorporated cities.

2/ Prince of Wales Census Subarea consists of Prince of Wales Island.

3/ The Prince of Wales-Hyder CA includes Prince of Wales Island, Metlakatla, and Hyder. Data for 2000 are for the Prince of Wales-Outer Ketchikan CA. Parts of this area were annexed in May 2008 by the Ketchikan Gateway Borough and the newly formed Wrangell City and Borough.

Sources: Alaska DOL 2009, 2012a; U.S. Census Bureau 2000, 2011a

Prince of Wales Island experienced a larger relative decrease in population than the region as a whole, with 569 fewer people recorded in the 2010 Census than a decade earlier, a decrease of 12 percent (Table SOC-1). A similar decrease was recorded in the Prince of Wales-Hyder CA, with total population dropping by 10 percent. However, population increased by a total of 440 between 2007 and 2011, which a recent article in Alaska Economic Trends suggests may be an indication that the local economy is stabilizing (Abrahamson 2012: 11).

This decrease in population between 2000 and 2010 was evident in all the communities in or near the project area, with the exception of Kasaan. Reductions in population in these communities ranged from about 12 percent (Coffman Cove and Klawock) to 19 percent (Hollis) (Table SOC-1). The largest absolute decrease occurred in Craig, the largest community on the island, which experienced a net decrease of 196 residents (14 percent). There were 86 fewer residents in Thorne Bay in 2010 than in 2000, a 15 percent reduction.

Population projections developed by the State of Alaska anticipate continued population growth statewide, but expect population to continue to decline in the boroughs and CAs in Southeast Alaska, including Prince of Wales-Hyder (Mercer 2010). Southeast Alaska is the only regional population in Alaska expected to decline over the forecast period (2009 to 2034). This decrease is projected because low birth rates and the highest median age in the state mean that a sharp rise in net in-migration would be required for growth to occur in the future (Mercer 2010).

3 Environment and Effects

Race and Ethnicity

The majority of the population in Alaska, almost two-thirds, identified as White in the 2010 Census. Alaska Natives were the largest minority group, accounting for 14 percent of the total population (Table SOC-2). The share of total population that identified as White in Southeast Alaska (65 percent) and on Prince of Wales Island (63 percent) was very similar to the State overall (64 percent), but Alaska Natives accounted for a larger share of the total population on Prince of Wales Island (24 percent versus 14 percent, statewide) (Table SOC-2).

The percentage of the population in nearby communities identifying as Alaska Native in 2010 ranged from less than 10 percent in Coffman Cove, Hollis, Naukati Bay, and Thorne Bay, to 35 percent in Kasaan and 48 percent in Klawock, both of which are home to federally recognized tribes. Craig also had a relatively high concentration of Alaska Native residents, with 232 people or 19 percent of the population identifying as Alaska Native in 2010 (SOC-2). These data are discussed in the Environmental Justice section below.

Table SOC-2. Race and Ethnicity 2010

Geographic Area/Community ^{1/}	Total Population	Percent of Total Population			
		White ^{2/}	American Indian and Alaska Native ^{2/}	Other Race ^{2/3/}	Two or More Races ^{2/}
Coffman Cove city	176	93	4	1	2
Craig city	1,201	64	19	5	12
Hollis CDP	112	88	4	3	4
Kasaan city	49	53	35	2	10
Klawock city	755	37	48	4	11
Naukati Bay CDP	113	88	6	1	5
Thorne Bay city	471	91	2	3	4
Prince of Wales Census Subarea	4,012	63	24	4	9
Prince of Wales-Hyder CA	5,559	50	39	3	8
Southeast Alaska	71,664	65	16	10	8
Alaska	710,231	64	14	15	6

Notes:

1/ See footnotes to Table SOC-1.

2/ Non-Hispanic only. The Federal Government considers race and Hispanic/Latino origin (ethnicity) to be two separate and distinct concepts. People identifying as Hispanic or Latino origin may be of any race. In this table people identifying as Hispanic or Latino are included in the Other Race category only.

3/ The "Other Race" category presented here includes census respondents identifying as Hispanic or Latino, Black or African American, Asian, Native Hawaiian and Other Pacific Islander, or Some Other Race.

Source: U.S. Census Bureau 2011a

Economic Conditions

This section provides an overview of local employment and income for Southeast Alaska and more specifically Prince of Wales Island, where the impacts of the Big Thorne Project are most likely to be experienced. The following subsections focus on those economic sectors—forest products, commercial fishing, and recreation and tourism—that could be affected by the project.

Direct employment in natural resource-based industries accounted for an estimated 26 percent of total employment in Southeast Alaska in 2004 (USDA Forest Service 2008c).

This total includes estimated wood products, mining, recreation and tourism, salmon harvesting, and seafood processing employment, but underestimates the importance of resource-based employment to the region because it does not include the share of government employment that is resource-based. Overall, the government sector accounted for 36 percent of covered employment in Southeast Alaska in 2012 (Alaska DOL 2013a).

A total of 1,920 non-agricultural wage and salary (NAWS) jobs were identified in the Prince of Wales-Hyder CA in 2011, with a total combined payroll of \$70.3 million (Table SOC-3). These data are compiled from unemployment insurance coverage data and do not include self-employed workers. The government sector dominates the Prince of Wales-Hyder CA economy, accounting for 47 percent of total NAWS employment and 51 percent of total annual earnings (Table SOC-3). These totals include Federal, State, and local jobs, with most of this employment concentrated in local government sector, which accounted for 40 percent of annual employment and wages in 2011 (Table SOC-3). The private sector (identified as Private Ownership in Table SOC-3) accounted for 53 percent and 49 percent of total employment and income, respectively, with the highest concentration of total employment (12 percent) in the Retail Trade sector (Table SOC-3).

Table SOC-3. Annual Employment and Earnings in the Prince of Wales-Hyder CA, 2011^{1/}

Economic Sector	Annual Average Employment		Annual Earnings		Average Monthly Earnings (\$)
	Number of Jobs	Percent of Total	Millions of Dollars	Percent of Total	
Natural Resources and Mining	113	6	5.2	7	3,825
--Forestry and Logging ^{2/}	88	5	4.5	6	4,217
Construction	66	3	2.7	4	3,474
Manufacturing	119	6	3.2	5	2,225
Trade/Transportation/Utilities	327	17	10.0	14	2,553
--Retail Trade ^{3/}	221	12	5.1	7	1,909
Information	11	1	0.4	1	3,203
Financial Activities	80	4	3.3	5	3,433
Professional & Business Services	42	2	1.8	3	3,595
Educational & Health Services	92	5	3.9	6	3,502
Leisure & Hospitality	143	7	3.3	5	1,907
Other Services	36	2	0.4	1	850
Total Private Ownership	1,027	53	34.1	49	2,766
Federal Government	99	5	6.1	9	5,132
State Government	34	2	1.9	3	4,565
Local Government	760	40	28.2	40	3,095
Total Government	893	47	36.2	51	3,377
Overall Total	1,920	100	70.3	100	3,050

Notes:

Totals may not sum due to rounding.

1/ These data are compiled from unemployment insurance coverage data and exclude self-employed workers because they are not covered by unemployment insurance. Occupations with relatively high shares of self-employment include the fish harvesting and construction sectors.

2/ Forestry and Logging is part of the Natural Resources and Mining sector.

3/ Retail Trade is part of the Trade/Transportation/Utilities sector.

Source: Alaska DOL 2012b

3 Environment and Effects

The annual, seasonally unadjusted, unemployment rate in Alaska was lower than the national average in 2012, 7.0 percent versus 8.1 percent. The corresponding rate for Southeast Alaska was 6.8 percent, lower than the state and national averages. The unemployment rate in Prince of Wales-Hyder CA was more than twice the regional average, 14.1 percent versus 6.8 percent, and the second highest in the boroughs and CAs that comprise Southeast Alaska. Of the Southeast Alaska boroughs and CAs, only the Hoonah-Angoon CA had a higher annual unemployment rate than the Prince of Wales-Hyder CA in 2012 (Alaska DOL 2013b).

An estimated 10.8 percent of the population was below the poverty line in Alaska in 2011. In Southeast Alaska, the percent of the population in boroughs/CAs below the poverty line ranged from just 4.6 percent in the Skagway Municipality to 18.5 percent in the Hoonah-Angoon CA. The Prince of Wales-Hyder CA had the second highest poverty rate in the region, with 17.1 percent below the poverty line in 2009 (U.S. Census Bureau 2012).

Median household income in Alaska was \$65,699 in 2011, 1.3 times the national median of \$50,502. Median household incomes in Southeast Alaska boroughs/CAs ranged from 62 percent of the State median in the Hoonah-Angoon CA to 113 percent of the State median in Juneau. The Prince of Wales-Hyder CA had the second-lowest median household income in the region, equivalent to 65 percent of the State median (U.S. Census Bureau 2012).

Forest Products Industry

The forest products industry, the natural resource-related economic sector that would be directly affected by the action alternatives proposed for this project, is discussed in the Issue 1: Timber Supply and Timber Sale Economics section of this EIS. As discussed in that section, regional employment in the forest products sector peaked at the end of the 1980s, dropped sharply in the 1990s, and has continued to decline over the past decade. This has also been the case locally on Prince of Wales Island. Forestry and logging and sawmill jobs accounted for 6 percent of total employment in the Prince of Wales-Hyder CA in 2010, down from 15 percent of total jobs in 2000. Viking Lumber remains one of the Prince of Wales-Hyder's largest private employers, with an estimated workforce of 32 full-time equivalent employees in 2010 (Abrahamson 2012; Alexander and Parrent 2012). In addition, data compiled by the Forest Service and the State of Alaska identified 25 mills and timber operators on the island (including the 8 noted above) and a review of the Alaska Department of Commerce's business license database identified an additional 19 forestry-related businesses (ADCCED 2012; Alexander and Parrent 2012; Peterson 2012; USDA Forest Service 2012c).

Commercial Fishing

The commercial fishing industry is a significant part of Alaska's economy, and this is also the case for Southeast Alaska. Seafood processing employed 1,450 people in Southeast Alaska in 2010, with an estimated 9,182 people in Southeast Alaska employed in fish harvesting (Alaska DOL 2011; Warren and Kreiger 2011). This combined total (10,632

jobs) was equivalent to about 30 percent of total covered employment in Southeast Alaska in 2010.²

Commercial fishing is an important part of the economy on Prince of Wales Island. Salmon, halibut, herring, and shellfish are all harvested in waters surrounding the island. Much of this harvest is taken by off-island fishers and processed in Ketchikan, Wrangell, and Petersburg, but processing also takes place in Craig. An estimated 564 residents on Prince of Wales Island were employed in fish harvesting in 2000 (Gilbertson and Robinson 2001). In 2010, 224 residents in the seven communities within 12 miles of the project area (Thorne Bay, Coffman Cove, Klawock, Craig, Hollis, Kasaan, and Naukati Bay) held commercial fishing permits, including 151 residents in Craig, 44 residents in Klawock, and 20 residents in Thorne Bay. In addition, 159 residents in these communities held crew member licenses in 2010, including 107 residents in Craig, 29 residents in Klawock, and 18 residents in Thorne Bay (Alaska Commercial Fisheries Entry Commission 2011). ADF&G reported that Prince of Wales-Hyder harvested 19.6 million pounds of fish in 2011, including 15.4 million pounds of salmon, resulting in earnings of \$15.9 million (Abrahamson 2012).

Recreation and Tourism

Recreation and tourism on Prince of Wales Island is discussed above in the Recreation section. As discussed in that section, recent estimates of visitors to Prince of Wales Island indicated that 15,000 out-of-state residents visited Prince of Wales Island in summer 2006, and an estimated 12,326 visitors participated in nature-based tourism on Prince of Wales Island in 2007 (McDowell Group 2007; Dugan et al. 2009). The nature-based tourism study estimated that these visitors brought in more than \$30 million to Prince of Wales Island in gross revenues, with most of this revenue related to sport fishing (Dugan et al. 2009). Fishing lodges and sport fish charter operators are located in Craig, Klawock, Thorne Bay, and Coffman Cove, as well as in more-remote locations around the island. Recreation and Tourism are discussed in more detail in the Recreation section, above, and the Socioeconomics Resource Report prepared for this project (Dadswell 2013).

Ecosystem Services

Ecosystem services are the products of functioning ecosystems that often are available without direct costs to people who benefit from them (Kline 2006). These services have been described in a number of different ways including the typology developed by the Millennium Ecosystem Assessment (2005), which is featured on the Forest Service's Ecosystem Services web site (<http://www.fs.fed.us/ecosystems-services/>) and identifies four general categories of ecosystem services: provisioning, regulating, cultural, and supporting. Provisioning services include wild food, fresh water, and fiber. Regulating services are the benefits obtained from ecosystem impacts on natural processes, such as air quality, climate stabilization, water quality, and erosion. Cultural services include recreation, aesthetic, educational, and spiritual and religious benefits. Supporting services

² Total covered employment estimates prepared by the Alaska DOL do not include the majority of fish harvesting jobs because most of these jobs are exempt from state unemployment insurance laws.

3 Environment and Effects

are the underlying processes that maintain the conditions for life on Earth, such as nutrient cycling and soil formation (Smith et al. 2011).

The concept of ecosystem services has emerged as a way of framing and describing the comprehensive set of benefits that people receive from nature. The Forest Service has been exploring use of these concepts to describe the benefits provided by forests, but the ecosystem service approach has not been applied operationally in a management context. The Forest Service's Pacific Northwest Research Station issued a technical report that attempts to define an economics research program to describe and evaluate ecosystem services (Kline 2006). More recently, the Pacific Northwest Research Station and the Deschutes National Forest have partnered to develop a place-based application to explore how this type of approach might be implemented by a national forest to enhance forest stewardship. Ecosystem services are discussed at the forest planning level for the Tongass National Forest in the 2008 Forest Plan EIS (USDA Forest Service 2008c, p. 3-544 to 3-556).

Environmental Consequences

The analysis area for direct, indirect, and cumulative effects to the socioeconomic resources addressed in this section varies by resource. Effects to the timber industry are assessed in terms of employment and income at the regional scale (i.e., Southeast Alaska), where effects are expected to occur. Effects to the commercial fishing and recreation and tourism sectors are assessed in terms of the analysis areas assessed for those resources. Ecosystem services are assessed by resource throughout this EIS, with analysis areas established for each resource.

Economic Conditions

Forest Products Industry

Potential impacts related to the forest products industry are discussed in the Issue 1: Timber Supply and Timber Sale Economics section, which summarizes impacts in terms of direct employment in logging and processing.

Commercial Fishing

Potential impacts to fish habitat are assessed in the Fisheries section of this EIS. Implementation of the applicable Forest Plan standards and guidelines and best management practices would mitigate potential impacts to fisheries. As a result, none of the action alternatives are expected to have measurable effects on fish habitat and are, therefore, unlikely to affect the commercial fishing or fish processing sectors. Potential impacts to commercial fishing and fish processing from timber harvest at the forest planning level are discussed in the 2008 Forest Plan EIS (USDA Forest Service 2008c).

Recreation and Tourism

A recent study estimated that nature-based tourism brought in more than \$30 million to Prince of Wales Island in gross revenues in 2007, with most of this revenue related to sport fishing (Dugan et al. 2009). The majority of sport fish visitors focus on saltwater fishing, which accounts for most of the nature-based tourism revenue generated on the island. As noted with respect to commercial fishing, the fisheries analysis prepared for

this project found that none of the alternatives are expected to have measurable effects on fish habitat and are, therefore, unlikely to affect businesses that focus on saltwater sport fishing.

Although none of the action alternatives are expected to have measurable effects on fish habitat, road building and timber harvest activities could affect access to freshwater fishing outfitter-guide locations in the project area, as well as the quality of the recreation experience of outfitter-guide clients in these areas. These impacts would be localized and temporary. None of the proposed alternatives are expected to result in long-term impacts to the ability of outfitter/guides to use these areas, but may temporarily displace some use.

Bear hunting is popular on Prince of Wales Island, with guided black bear hunting and drop-off and transporter services available (Dugan et al. 2009). However, the majority (80 percent) of guided hunts on the island are conducted by motorized boat in shoreline areas, with just 12 hunting location days recorded in the Big Thorne project area between 2004 and 2008 (USDA Forest Service 2010b). Potential impacts to black bears are evaluated in the Issue 3: Wildlife and Subsistence Use section, which assumes that black bears would primarily be impacted by new road construction and reconstruction, with new and improved roads expected to improve hunter access and potentially result in over harvesting. There are a number of access restrictions on black bear hunting within the project area, as determined by ADF&G. However, none of the alternatives are expected to affect businesses that offer guided black bear hunting and related services.

Potential impacts to recreation and tourism from timber harvest at the forest planning level are discussed in the 2008 Forest Plan EIS (USDA Forest Service 2008c).

Ecosystem Services

Ecosystem services are those services and benefits provided by healthy ecosystems. Under the 2008 Forest Plan, timber management activities are governed by a large number of rules and regulations designed to protect or mitigate negative impacts to natural resources that provide ecosystem services. This is discussed further in the 2008 Forest Plan EIS (USDA Forest Service 2008c, p. 3-553 to 3-556). As noted in the Issue 1: Timber Supply and Timber Sale Economics section, the financial efficiency analysis prepared for this project in accordance with FSH 2409.18 does not account for non-market benefits or other values, benefits, and costs that are not easily quantifiable. This is not to imply that such values are not significant or important, but to recognize that non-market values are difficult to represent by appropriate dollar figures. Although the Forest Service has been exploring use of ecosystem services concepts to describe the benefits provided by forests, this type of approach has not been applied operationally in a management context (Kline 2006; Smith et al. 2011).

The effects of the action alternatives on these types of services are assessed in the sections of this EIS that address watersheds, fisheries, soils, wildlife and subsistence use, heritage resources, and timber and vegetation, among others. Monetary values are not assigned to these services, but this does not lessen their importance in the decision making process. Decision-makers will consider the economic values presented in the Issue 1: Timber Supply and Timber Sale Economics section within the context of the information

3 Environment and Effects

presented elsewhere in this document, much of which cannot readily be translated into economic terms.

Direct and Indirect Effects

Alternative 1 – No Action

There would be no proposed Big Thorne Project under the no action alternative and the project would not meet the Purpose and Need, which is to contribute to a long-term supply of economic timber industry on Prince of Wales Island and on the Tongass National Forest in general (including both large and small operators). As discussed in the Issue 1: Timber Supply and Timber Sale Economics section, the provision of a long-term stable and economic timber supply is intended to support local operators and encourage investment in the wood products industry as it transitions to second-growth harvesting and restoration activities. Long term in this context is defined as approximately 10 years (see the project Purpose and Need statement).

Current utilization rates at the mills included in the 2011 mill survey are low, with just 9.9 percent of existing active capacity utilized in 2011 (Parrent 2012). In the absence of a long-term (i.e., multiple year) stable supply of economic timber from the Big Thorne Project or elsewhere, the future viability of existing mill operators could be adversely affected. Closure of one or more of the existing mills would result in a further reduction in jobs in the logging and sawmilling industries and could also affect local businesses that provide goods and services to these industries.

The absence of a long-term supply of economic timber could also adversely affect future investment and the potential for increased wood products employment in the future, as well as the anticipated transition of the wood products industry to second growth harvesting and restoration activities.

There would be no timber harvest or road construction/reconstruction under this alternative and no impacts to the commercial fishing or recreation and tourism industries on Prince of Wales Island or elsewhere in the region.

Alternatives 2, 3, 4, and 5

The Issue 1: Timber Supply and Timber Sale Economics section includes an assessment of potential impacts in terms of direct logging and sawmill/export employment that would be supported by the projected harvest volumes under each alternative. This analysis is based on average job/MMBF ratios developed using harvest and employment data from 2007 to 2010 and assumes that all the units and volume identified for each alternative would be harvested over time. The resulting estimates are approximate numbers that allow a comparison of alternatives. Total estimated direct employment ranges from 341 to 386 jobs under Alternative 4 to 706 to 816 jobs under Alternative 3, reflecting the relative volumes that would be made available under each alternative (see Table TSE-13 in the Issue 1: Timber Supply and Timber Sale Economics section). Direct employment is presented as a range for each alternative to account for the effect of the limited interstate shipment policy and export, which allows the purchaser to ship up to 50 percent of the total sale volume applied to spruce and hemlock logs out of state in whole log form. Western redcedar and Alaska yellow-cedar may also be exported. This is discussed

further in the Issue 1: Timber Supply and Timber Sale Economics section. The Big Thorne project would also support indirect jobs elsewhere in the region.

The potential impact to nearby communities with processing facilities that may utilize the timber will depend on many elements associated with the competitiveness and efficiency of individual operations. Such factors are dependent upon private business decisions, as well as market conditions for forest products. The Forest Service cannot predict which firms will successfully bid for a timber sale, and thus potential jobs and incomes are estimated at a regional scale, not for individual communities.

Nature-based tourism on Prince of Wales Island is mainly related to saltwater fishing. Saltwater fishing-related recreation and tourism is not expected to be affected under the action alternatives. The action alternatives would all have short-term impacts on recreation and outfitter-guide use in the project area, but these impacts are not expected to have long-term impacts (i.e., impacts that extend beyond the duration of localized project activities) on the ability of outfitter-guides to use currently permitted locations. Potential impacts to ecosystem services other than timber are not addressed in monetary terms, but are discussed in the other resource-specific sections of this EIS.

Cumulative Effects

Alternative 1 – No Action

Under Alternative 1, there would be no timber made available under the Big Thorne Project and timber operators on Prince of Wales Island and elsewhere in Southeast Alaska would not be able to bid on future timber offerings under this project. Timber projects listed in Appendix D, Part II and discussed above in the Issue 1: Timber Supply and Timber Sale Economics section would also contribute to the timber supply. As discussed above, in the absence of this project and other sources of long-term (multiple-year) economic timber, the future viability of existing operators in Southeast Alaska could be adversely affected. Closure of one or more mills would result in a further reduction in jobs in the logging and sawmilling industries and could also affect local businesses that provide goods and services to these industries. Further, the absence of a multiple-year timber supply could adversely affect the anticipated transition of the wood products industry to young-growth harvesting and restoration activities

Alternatives 2, 3, 4, and 5

Past timber sales have contributed to the development of the existing road system in the Big Thorne project area that would be used under this alternative. Timber harvest under this alternative would contribute to meeting projected market demand for timber in Southeast Alaska and support logging, sawmilling, and transportation and other services jobs. The other reasonably foreseeable projects identified that involve timber harvest would also help meet this demand and support logging, sawmilling, and transportation and other services jobs. Other reasonably foreseeable projects would also support jobs and income in the vicinity of the project area.

Short-term cumulative impacts to recreation and outfitter-guide use could occur if one or more of the reasonably foreseeable projects were to coincide in time and space with the project. This could result in additional temporary disruptions to recreation use and could

3 Environment and Effects

affect the quality of the recreation experience in localized areas. These types of impacts would be limited to the duration of road building and harvest activities in a particular location. The Prince of Wales Outfitter/Guide Management EA allocates commercial recreational use on Prince of Wales Island (USDA Forest Service 2012e). None of the alternatives are expected to affect the implementation of this project.

Environmental Justice

Background and Affected Environment

Environmental justice refers to the fair treatment of people of all races, cultures, and incomes with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The CEQ's Environmental Justice: Guidance under the National Environmental Policy Act (CEQ 1997) indicates that environmental justice concerns may arise from impacts on the natural or physical environment, such as human health or ecological impacts on minority and low-income populations, or from related social or economic impacts.

The Big Thorne Project is a Federal action that has potential environmental effects. The following environmental justice assessment considers whether there is a disproportionately high and adverse effect from any of the alternatives on low-income and minority populations in communities near the project area, and tiers to the analyses presented in the Wildlife and Subsistence, Fisheries, and Heritage Resource Reports prepared for this project (Woeck 2013a; Knutzen 2013; Marshall 2013).

The guidelines provided by the CEQ (1997) and similar direction provided by the EPA (1998) indicate that a minority community may be defined where either 1) the minority population comprises more than 50 percent of the total population, or 2) the minority population of the affected area is meaningfully greater than the minority population in the general population of an appropriate benchmark region used for comparison. Minority communities may consist of a group of individuals living in geographic proximity to one another, or a geographically dispersed set of individuals who experience common conditions of environmental effect.

Race and ethnicity is discussed by community in the Socioeconomics section of this document. Minority communities in the vicinity of the project area include Kasaan and Klawock, both of which are home to federally recognized tribes. Thorne Bay, the only community located in the project area, is predominantly White, with 91 percent of the population identifying as White in the 2010 Census (see Table SOC-2).

The CEQ guidance clarified that such analyses should recognize the interrelationships between cultural, social, occupational, historical, and economic factors that may amplify the environmental impacts. For example, subsistence in Alaska Native communities is not only important economically, it is also important for reasons of tradition and culture; consequently, impacts on subsistence resource use also impact the social and cultural lives of residents. The CEQ guidance clarified that the identification of disproportionate effects does not preclude the agency from going forward with the proposed action, but should heighten attention to project alternatives, mitigation and monitoring needs, and the preferences of the affected communities (CEQ 1997, p. 10).

Environmental Consequences

Direct, Indirect, and Cumulative Effects

Timber harvest has the potential to affect subsistence use in the project area, which could disproportionately affect Alaska Native subsistence users. Potential impacts to

3 Environment and Effects

subsistence resources are discussed in detail in the section of this document that evaluates Issue 3: Wildlife and Subsistence Use. As discussed in that section, none of the alternatives are expected to affect subsistence use of fish and marine invertebrates, plants, or timber and firewood for personal use.

Impacts to the wildlife component of subsistence food resources are addressed in terms of potential impacts to Sitka black-tailed deer, the largest component of wildlife subsistence resources in the project area. The action alternatives would all result in a reduction in deer habitat capability, with the largest reduction occurring under Alternative 3. The Issue 3: Wildlife and Subsistence Use analysis found that under all action alternatives, reductions in deer habitat capability due to the Big Thorne Project in combination with past, present, and reasonably foreseeable actions would further reduce the ability of WAAs 1315 and 1420 to sustain current harvest levels.

These potential reductions could result in changes to consumption patterns of resource use in the project area, but none of the alternatives are expected to have a disproportionately high and adverse effect on the health or well-being of the minority or low-income populations that use the project area. Any changes in consumption patterns and wild food resources, as well as other project effects, would be equally applicable to the general population.

Other Environmental Considerations

Relationship between Short-term Uses and Long-term Productivity

The intensity and duration of the effects described in this EIS depend on the alternative and the mitigation measures applied to protect the resources. Most unavoidable effects are expected to be short term. Short-term effects usually last less than 2 to 5 years. Effects would be managed to comply with established legal limits in all cases, such as maximum time for regeneration. Monitoring procedures and mitigation measures have been planned for those areas that may be affected to reduce these effects. Specific mitigation measures are documented in the unit and road cards (Appendices B and C of the Draft EIS; if a decision is made to harvest, mitigation measures for harvest units and roads will be listed in the ROD).

Some localized adverse effects may occur on a recurring, though temporary, basis. Effects such as road construction, timber harvest, timber hauling, recreation traffic on untreated roads, and the operation of internal combustion engines may cause temporary adverse effects to air quality.

All alternatives would come under the mandate of the Multiple Use and Sustained Yield Act of 1960. This act requires the Forest Service to manage NFS lands for multiple uses including timber, recreation, fish and wildlife, range, and watershed. All renewable resources are to be managed in such a way that they are available for future generations. The harvesting and use of standing timber can be considered a short-term use of a renewable resource. Trees can be reestablished and grown again as a renewable resource if the productivity of the land is not impaired.

Maintaining the productivity of the land is a complex, long-term objective. All alternatives protect the long-term productivity of the project area through the use of specific standards and guidelines, mitigation measures, and BMPs. Long-term productivity could change as a result of various management activities proposed in the alternatives. Timber management activities would have direct, indirect, and cumulative effects on the economic, social, and biological environment.

Soil and water are two key factors in ecosystem productivity, and these resources would be protected in all alternatives to avoid damage that could take many decades to rectify. Sustained yield of timber, wildlife habitat, and other renewable resources all rely on maintaining long-term soil productivity. Quality and quantity of water from the project area may fluctuate as a result of short-term uses, but no long-term effects to the water resource are expected to occur as a result of timber management activities.

Timber harvest is a short-term use of wetland resources. Harvest activities are expected to slightly alter the hydrology of harvested wetlands for several years after harvest. Soil moisture levels are expected to rise slightly following harvest due to the loss of canopy interception. Soil moisture levels are anticipated to return to near pre-harvest levels as young-growth establishes and provides canopy cover across the site.

3

Environment and Effects

Irreversible and Irretrievable Commitments of Resources

"Irreversible commitments" is a term that describes the loss of future options. It applies primarily to the effects of the use of non-renewable resources, such as minerals or cultural resources, or to those factors such as soil productivity that are only renewable over long periods of time.

Loss of soil due to erosion and mass failures is an irreversible commitment of resources. The loss of soil resources has been minimized to the extent feasible in all action alternatives by following Region 10 Soil Quality Standards, incorporating BMPs and applying mitigation measures specified in this document.

Road construction is an irreversible action because of the time it takes for a constructed road to revert to natural conditions. Irreversible actions also include the associated rock quarries which are developed in conjunction with these roads.

Soils and wetlands displaced by road construction activities are irreversible commitments of project resources, due to the long-term loss of soil productivity. It is irreversible because the soils and wetland resources have deteriorated to the point that renewal can occur only over a long period of time or at a great expense, or because the wetland soils have been destroyed or removed. In road construction, wetland soils are either scraped away or are buried beneath road fill, greatly limiting their pre-disturbance productivity.

Loss of heritage resource sites resulting from accidental damage or vandalism would be an irreversible commitment of resources. Standards and guidelines, survey methodology prior to activities, and mitigation measures specified in this document provide reasonable assurance that no irreversible loss of heritage resources would occur.

"Irretrievable commitments" is a term that applies to the loss of production, harvest, or use of natural resources. For example, some or all of the timber production from an area is lost irretrievably while an area is serving as a winter sports site. The production lost is irretrievable, but the action is not irreversible. If the use changes, it is possible to resume timber production.

Old-growth forest structure converted to even-aged forest structure by timber harvest can be considered an irretrievable commitment of the old-growth structure, especially if the land is continually managed for optimum timber production. It is not expected that old-growth characteristics would naturally reoccur within harvest areas for 150 years or more; however, old-growth forest structure would eventually return to the landscape. However, foregoing timber harvest opportunities at this time in certain areas, due to resource concerns or economics, may represent an irretrievable commitment of resources because that volume cannot be harvested. The commitment is irretrievable rather than irreversible because future entries could harvest those areas if they are still classified as part of the suitable timber base.

The reduction in the visual quality of an area due to timber harvesting would be an irretrievable commitment of resources. The commitment is irretrievable because viewsheds will typically heal from a visual quality standpoint after about 40 years. Second-growth trees will have the color and height needed so as not to be evident to the casual observer after this time.

Unavoidable Adverse Environmental Effects

Implementation of any of the action alternatives would result in some adverse environmental effects that cannot be effectively mitigated or avoided if the proposed action or alternatives are implemented. The interdisciplinary procedure used to identify specific harvest units and roads was designed to eliminate or reduce significant adverse consequences. In addition, the application of Forest Plan Standards and Guidelines, BMPs, mitigation measures, and a monitoring plan are intended to further limit the extent, severity, and duration of these effects. The specific environmental effects of the alternatives were discussed earlier in this chapter, and mitigation measures are discussed in Chapter 2. Formulation of alternatives includes the avoidance of potentially adverse environmental effects; however, some adverse impacts to the environment that cannot be completely mitigated would occur.

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